No. 4091.540
v. 41.
1914

THE TRUSTEES OF THE PUBLIC LIBRARY
OMNIVM LVX CIVIVM
OF THE CITY OF BOSTON
1852 1878

NA1
.B2

Sept. 21 25
1 cent
*4091.240
July-Dec-1924
Vol XLI
F.A.

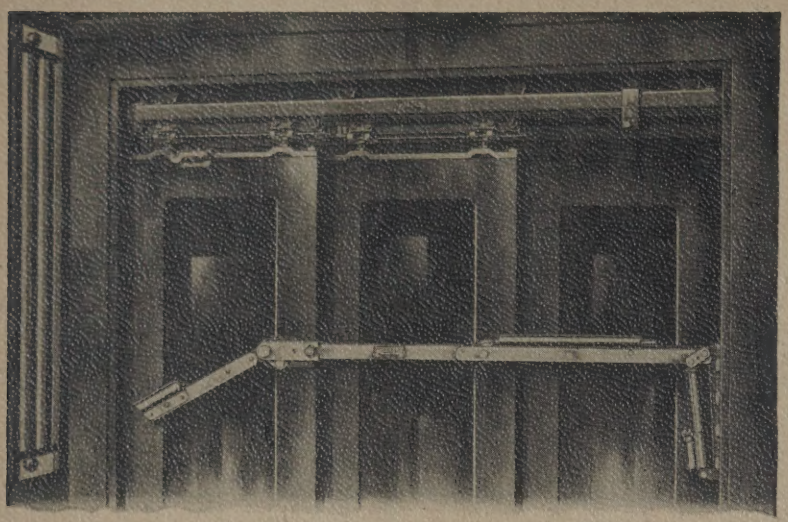
THE ARCHITECTURAL FORUM

Rec'd
JUL
7
1924
B.P.L.

*4091.240
41.
July-Dec
1924

JULY 1924

QVALITY LEAVES ITS IMPRINT



R-W IDEAL Elevator Door Hardware for silent, safe and speedy service from one year to the next.

R-W Vanishing Door Hardware for the modern home.

SLIDETITE equipped garage doors slide and fold inside, away from wind, ice and snow.

R-W Barn Door Hangers for durability and ease of operation in all weathers.

R-W Industrial Door Hangers for factory, round house, car shop and pier shed doors.

The Achievement of Perfection

Countless installations of R-W IDEAL Elevator Door Hardware are daily proving its perfection — not only in ease, silence and safety of operation, but in its ability to withstand the most abusive service. Long years of development of this type of equipment have made R-W IDEAL Elevator Door Hardware ideal both in name and in performance.

R-W IDEAL Elevator Door Hardware is today universally accepted as standard, due to its acknowledged superiority. Like all other types of R-W Door Hangers, its leadership is never challenged.

In addition to R-W IDEAL Elevator Door Hardware, we produce hangers for every door that slides. There are hangers for great factory doors, for fire doors, for garage doors, for barn doors, and for use in the home.

Write today for free architectural detail folio, from which actual blueprints of elevator door installations can easily be made, as well as for particulars of R-W IDEAL Elevator Door Hardware. Just ask for Catalog F-21. Literature describing other types of R-W Door Hangers will also be sent if requested.

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(615)

THE ARCHITECTURAL FORUM

*4091.240
41.
July-Dec,
1924.

INDEX

VOLUME XLI

July to December, Inclusive, 1924

v.1

Published by

ROGERS AND MANSON COMPANY
383 Madison Avenue New York

2483

PUBLIC LIBRARY
OF THE
CITY OF BOSTON

THE ARCHITECTURAL FORUM

INDEX TO VOLUME XLI — JULY TO DECEMBER, 1924

Index to Illustrations According to Subject

KEY TO PAGES AND PLATES

	Pages	Plates	Foreign Plates
July	1- 44	1-16	
August	45- 88	17-32	
September	89-160	33-48	
October	161-204	49-56	*1-8*
November	205-268	57-72	
December	269-312	73-80	*9-16*

Numbers preceded by month and **Ser.** refer to Service Section.

BUILDINGS (Complete)

Apartments "The Chateau," Jackson Heights, N. Y., ex. pl. 62
Linden Court, Jackson Heights, N. Y., ex. 63, 64
"The Towers," Jackson Heights, N. Y., ex. pl. 64-66
Apartment Hotels Alcazar Hotel, Cleveland, O., ex. pl. 244, **63, 64**
Alden Park Manor, Brookline, Mass., ex. pl. 260
Bellerive Apartment Hotel, Kansas City, Mo., ex. in. pl. **67, 68**
Belmont Hotel, Chicago, Ill., ex. in. pl. 219, 220, 238, 239, **57, 58**
Concourse Plaza Apartments, New York, N. Y., ex. in. pl. 247, 248
Fenway Hall, Cleveland, O., ex. in. pl. 321, 232
Gaylord Apartments, Los Angeles, Cal., ex. in. pl. 263, 264
Highland Plaza Apartments, Birmingham, Ala., ex. pl. 259
Hudson View Apartments, New York, N. Y., ex. pl. 235, 236
Huntington Apartments, San Francisco, Cal., ex. in. pl. 61, 62
Lake Shore Drive Hotel, Chicago, Ill., ex. in. pl. 217, 218, 240, **59, 60**
Madison Apartment Hotel, New York, N. Y., ex. in. pl. 227-230, 243
Melbourne Hotel, St. Louis, Mo., ex. in. pl. **65, 66**
Park Lane Hotel, New York, N. Y., ex. in. pl. 206-212
Park Lane Villa, Cleveland, O., ex. in. pl. 244, **71, 72**
Pearson Hotel, Chicago, Ill., ex. in. pl. 224-226, 266
Pennsylvania Hotel, Philadelphia, Pa., ex. in. pl. 261, 262
Schenley Apartments, Pittsburgh, Pa., ex. pl. 241, 242
Sheraton, The, Boston, Mass., ex. in. pl. **69, 70**
Automobile Sales Buildings Semmes Building, Washington, D. C., ex. pl. 154
Banks Bank of Italy, Los Angeles, Cal., ex. in pl. **35-37**
Phoenix National Bank, Hartford, Conn., ex. in. pl. 185-192, **49-51**
Chambers of Commerce Newark, N. J., ex. in. pl. **77, 78**
Churches St. Paul's Newburyport, Mass., ex. in. pl. **29, 30**
Clubs Fraternity Clubs Building, New York, N. Y., ex. in. pl. 9-16, **1-8**
Court Houses County Sessions House, Warwick, England, ex. in. 173-176
Third District Court, New York, N. Y., ex. in. pl. 87, **31, 32**
Expositions Buildings British Empire Exhibition, Wembley, England, ex. 29-32, **9**
Fraternal Buildings Masonic Temple, Birmingham, Ala., ex. in. pl. 169-172
Government Buildings Federal Building, Honolulu, Hawaii, ex. pl. 21-24
Hotels Roosevelt, New York, N. Y., ex. in. pl. ....Frontis, 278-284, **73-76**
Royal Bermudiana, Hamilton, Bermuda, ex. in. pl. **13-16**
West Virginian, Bluefield, West Va., ex. in. pl. 181-184
Houses Ballard, Ernest S., Hubbard's Woods, Ill., ex. in. pl. 46-48
Chancellor, Dr. P. S., Millbrook, N. Y., ex. in. pl. 177-180
Deford, John E., Baltimore, Md., ex. in. pl. 203, **52, 53**
Kellogg, J. G., Winnetka, Ill., ex. in. pl. 285-288
Kingsley, Dr. W. S., Palm Beach, Florida, ex. in. pl. 73, 75, 76, **27, 28**
"Little Orchard," Mrs. Laura Levering, Greenwich, Conn., ex. in. pl. 289-292
Mizner, Addison, Palm Beach, Florida, ex. in. pl. 74, **25, 26**
Morgan, Miss Anne, Sutton Place, New York, N. Y., ex. in. pl. 49, 58, 59, **18, 22-24**
Potter, Alonzo, Smithtown, N. Y., ex. in. pl. 203, **54-56**
Springer, Dr. Harold L., Rockland, Del., ex. pl. 311, **79, 80**
Underhill Farm, House of Myron C. Taylor, Locust Valley, N. Y., ex. in. pl. 162-168
Vanderbilt, Mrs. W. K., Sutton Place, New York, N. Y., ex. in. pl. 50-58, 60, **17, 19-21**
Institutions Berkeley's Hospital, Worcester, England, ex. 67-72
Markets Wool Market, Chipping Camden, Gloucestershire, England, (measured drawing) ex. in. 25-28
Municipal Buildings Brooklyn, N. Y., ex. pl. 153
Museums Metropolitan Museum—New American Wing, ex. 312
Office Buildings Alexander Building, San Francisco, Cal., ex. pl. 102
American Radiator Co. Building, New York, N. Y., ex. in. pl. 105, **45**
Arsenal Building, New York, N. Y., ex. 96
Ashland National Bank Building, Ashland, Kentucky, ex. pl. 142
Bank of Italy Building, Los Angeles, Los Angeles, Cal., ex. in. pl. **35-37**
Boston Insurance Exchange, Boston, Mass., ex. pl. **41, 42**
Bouzan Building, New York, N. Y., ex. 95
Buhl Building, Detroit, Mich., ex. pl. 116
Bush Terminal Building, London, England, ex. 92, 93, 160
Chamber of Commerce Building, Newark, N. Y., ex. in. pl. **77, 78**
Garment Building, New York, N. Y., ex. 95
Genesee Building, Buffalo, N. Y., ex. in. pl. **45, 46**
Johns-Manville Building, New York, N. Y., ex. pl. 109
Keefer Building, Montreal, Canada, ex. pl. **48**
Knapp Buildings, New York, N. Y., ex. pl. 133
London Guarantee & Accident Building, Chicago, Ill., ex. in. pl. **38-40**
New Caron Building, Montreal, Canada, ex. pl. 158
New York, N. Y., 24 West 40th St., ex. 94
Pacific Gas & Electric Building, Oakland, Cal., ex. pl. 134
Pacific Gas & Electric Building, San Francisco, Cal., ex. 103
Pacific Telephone & Telegraph Co. Building, San Francisco, Cal., ex. pl. 115
Postum Building, New York, N. Y., ex. pl. 110
Standard Oil Building, San Francisco, Cal., ex. pl. 101, **33, 34**
Standard Oil Building, New York, N. Y., ex. in. ....Frontis, 106, 107
Straus, S. W. & Co. Building, ex. in. pl. 108, **44**
Tribune Tower Building, Chicago, Ill., ex. pl. 100
U. S. National Bank Building, Denver, Col., ex. pl. 140
Westinghouse Building, New York, N. Y., ex. pl. **47**
Restaurants New Arrowhead Inn, New York, N. Y., ex. in. pl. 269-276

FORUM STUDIES OF EUROPEAN PRECEDENTS

Baroque Doorways—Church of San Siro, Genoa *9*
Gateway in Nuremberg *8*
Hotel Vogue, Dijon *16*
No. 8 Restiere del Molo, Banco di Roma, Genoa *10*
Palazzo Cataldi, Genoa *11*
Palazzo Doria a Fassalo, Genoa *12*
Palazzo Serra, Genoa *13*
Palazzo Podesta, Genoa *14*
Palazzo Reale, Genoa *15*
Bridge over Donnier River Valley on road from Bourg to Geneva *2*
Colonnade and Fountains, Temple of Music, Versailles *3*
Detail of Loggia, Palazzo Doria, Genoa *7*
Doorway of the Rathaus, Rothenberg *4*
End Pavilion and Wall of Stable Court, Fontainebleau *6*
Frauen Kirche and Neptune Fountain, Nurem berg *1*
Notre Dame from the River, Paris *5*

GARDENS

San Domenico, Florence (It. Ren.) 294-300

INTERIORS

Audioriums Masonic Temple, Birmingham, Ala. 171
Ball Rooms Park Lane Hotel, New York, N. Y. (Louis XVI) 208, 211
Banking Rooms Bank of Italy, Los Angeles, Cal. **37**
Phoenix National Bank, Hartford, Conn. 191
Churches St. Paul's, Newburyport, Mass. **30**
Court Rooms Third District Court, New York, N. Y. 87, **32**
Dining Rooms Arrowhead Inn, New York, N. Y. 273
Ballard, Ernest S., Hubbard's Woods, Ill. 48
Bellerive Apartment Hotel, Kansas City, Mo. **68**
Belmont Hotel, Chicago, Ill. (Directoire) **58**
Fraternity Clubs Building, New York, N. Y. **8**
Gladstone Apartment Hotel, New York, N. Y. 246
Kingsley, Dr. W. S., Palm Beach, Fla. **28**
Lake Shore Drive Hotel, Chicago, Ill. **60**
Madison Apartment Hotel, New York, N. Y. 243
Melbourne Hotel, St. Louis, Mo. (Tudor) **66**
Mizner, Addison, Palm Beach, Fla. **26**
Morgan, Miss Anne, New York, N. Y. **22**
Park Lane Hotel, New York, N. Y. 209
Pearson Hotel, Chicago, Ill. (Adam) 226
Pennsylvania Hotel, Philadelphia, Pa. 262
Roosevelt Hotel, New York, N. Y. 282, 283
Royal Bermudiana Hotel, Hamilton, Bermuda **16**
Underhill Farm, Locust Valley, N. Y. 167
Vanderbilt, Mrs. W. K., New York, N. Y. 56, **20**
West Virginian Hotel, Bluefield, West Va. 183
Directors' Rooms Alfred, J. E. & Co., New York, N. Y. 145
Borden Building, New York, N. Y. 144
Drawing Rooms Chancellor, Dr. P. S., Millbrook, N. Y. 178
Fraternity Clubs Building, New York, N. Y. **7**
Kellogg, J. G., Winnetka, Ill. 286
"Little Orchard," Greenwich, Conn. 291
Mizner, Addison, Palm Beach, Fla. **26**
Morgan, Miss Anne, New York, N. Y. **23**
Vanderbilt, Mrs. W. K., New York, N. Y. 52, 54
Underhill Farm, Locust Valley, N. Y. 163, 168
Grill Rooms Roosevelt Hotel, New York, N. Y. 282
Royal Bermudiana Hotel, Hamilton, Bermuda **16**
Halls and Corridors Arrowhead Inn, New York, N. Y. 273
Deford, John E., Baltimore, Md. **53**
Federal Building, Honolulu, Hawaii **23**
French Exposition, Grand Central Palace, New York, N. Y. **11, 12**
Gladstone Apartment Hotel, New York, N. Y. 243
Kellogg, J. G., Winnetka, Ill. 287
Madison Apartment Hotel, New York, N. Y. 229
Potter, Alonzo, Smithtown, N. Y. **56**
Standard Oil Building, New York, N. Y. 106
Underhill Farm, Locust Valley, N. Y. 166
Kitchens Coronado Hotel, St. Louis, Mo. 266
Pearson Hotel, Chicago, Ill. 266
Wade Park Manor, Cleveland, O. 266
Libraries Chancellor, Dr. P. S., Millbrook, N. Y. 178, 180
Hotel Gouthiere, Paris (measured drawings) 307-310
Morgan, Miss Anne, New York, N. Y. **23, 24**
Pearson Hotel, Chicago, Ill. 224
Underhill Farm, Locust Valley, N. Y. 162
Lobbies American Radiator Co. Building, New York, N. Y. 105
Arrowhead Inn, New York, N. Y. 272
Bank of Italy Building, Los Angeles, Cal. **37**
Belmont Hotel, Chicago, Ill. **58**
Chamber of Commerce Building, Newark, N. J. **78**
Concourse Plaza Apartments, New York, N. Y. 248
Cunard Building, New York, N. Y. 107
Fenway Hall, Cleveland, O. 232
Fraternity Clubs Building, New York, N. Y. **4, 5**
Genesee Building, Buffalo, N. Y. **46**
Huntington Apartments, San Francisco, Cal. **62**
Lake Shore Drive Hotel, Chicago, Ill. 240, **60**
London Guarantee & Accident Building, Chicago, Ill. **40**
Madison Apartment Hotel, New York, N. Y. 228
Park Lane Hotel, New York, N. Y. 211
Pearson Hotel, Chicago, Ill. 226
Roosevelt Hotel, New York, N. Y. 281, **74**
Straus Building, Chicago, Ill. 108
West Virginian Hotel, Bluefield, West Va. ..182
Lodge Rooms Masonic Temple, Birmingham, Ala. 170, 172
Lounges Belmont Hotel, Chicago, Ill. 238
Fraternity Clubs Building, New York, N. Y. **3**
Gaylord Apartments, Los Angeles, Cal. 264
Pennsylvania Hotel, Philadelphia, Pa. 262
Roosevelt Hotel, New York, N. Y. 280, **75**
West Virginian Hotel, Bluefield, West Va. 182
Private Offices American Press Association, New York, N. Y. 143
Borden Building, New York, N. Y. 144
Evening News Building, Detroit, Mich. ..145, 146
Morgan, Miss Anne, New York, N. Y. **24**

***Illustrated; ex. exterior; in. interior; pl. plan.** See key to determine month on page ii

INTERIORS—*Continued*

Restaurants Arrowhead Inn, New York, N. Y. 273
Solarium Fraternity Clubs Building, New York, N. Y. 5
Gaylord Apartments, Los Angeles, Cal.....264
Sagamore Hotel, Rochester, N. Y.....237
Studios Kellogg, J. G., Winnetka, Ill....286, 287

ARCHITECTURAL DETAILS

Ceilings Bank of Italy, Los Angeles, Cal. (It. Ren.) 37
Lobby, Belmont Hotel, Chicago, Ill. (Coffered) 58
Lobby, Chamber of Commerce Bldg., Newark, N. J. (Vaulted)....78
Lobby, Roosevelt Hotel, New York, N. Y. (Plaster-Painted) 261
Phoenix National Bank, Hartford, Conn. (Plaster) (measured drawing).....190
Colonnades London Guarantee & Accident Building, Chicago, Ill. 39
Doorways, Exterior Bank of Italy, Los Angeles, Cal. (It. Ren.) 35
Boston Insurance Exchange, Boston, Mass. (Classic) 42
Chamber of Commerce Building, Newark, N. J. (It. Ren.) 77
Chancellor, D. P. S., Millbrook, N. Y. (Fr. Ren.) 179
Fraternity Clubs Building, New York, N. Y. (It. Ren.) (measured drawing).....12, 13
Garden, San Domenico, Florence (It. Ren.) 299
London Guarantee & Accident Building, Chicago, Ill. (It. Ren.)....39
Morgan, Miss Anne, New York, N. Y. (Col.) (measured drawing) 58, 59
Phoenix National Bank, Hartford, Conn. (It. Ren.) 50
St. Paul's Church, Newburyport, Mass. (Col.) 30
Sheraton, The., Boston, Mass. (Col.).....70
Third District Court, New York, N. Y. (It. Ren.) 32
Vanderbilt, Mrs. W. K., New York, N. Y. (Georgian) (measured drawing) 58, 60
Doorways, Interior Arch built about 1800, Baltimore, Md. (measured drawing)..199, 200
Fraternity Clubs Building, New York, N. Y. (It. Ren.) 6
Madison Apartment Hotel, New York, N. Y. (Eng. Ren.) 229
New Arrowhead Inn, New York, N. Y. (It. Ren.) 272
Sheraton, The, Boston, Mass. (Adam).....70
Vanderbilt, Mrs. W. K., New York, N. Y. (Antique Painted) 20
Facade County Sessions House, Warwick, England (measured drawing) 175
Fireplaces Baltimore, Md. (Early Federal Period) (measured drawings) 201, 202
Chancellor, Dr. P. S., Millbrook, N. Y. (It.) 178, 180
Deford, John E., Baltimore, Md. (Adam)....53
Fraternity Clubs Building, New York, N. Y. (It. Ren.) 6
Morgan, Miss Anne, New York, N. Y. (Col.) 22
Potter, Alonzo, Smithtown, N. Y. (It.).....56
Royal Bermudiana Hotel, Hamilton, Bermuda 15
Taylor, Myron C., Locust Valley, N. Y. (It.) 166
Vanderbilt, Mrs. W. K., New York, N. Y. (Georgian) 52
Flooring Fenway Hall, Cleveland, Ohio (Tile) 232
Fountains Alcazar Hotel, Cleveland, Ohio....64
Lobby, Belmont Hotel, Chicago, Ill....Frontis
Solarium, Gaylord Apartments, Los Angeles, Cal. 264
Gateways Old Renaissance Garden, San Domenico, Florence (Iron and Wooden Gates) (measured drawings) 296, 297
Grilles Bronze Door Grille, Third District Court, New York, N. Y. 32
Window and Entrance Grilles, Phoenix National Bank, Hartford, Conn. (Span. Ren.) (measured drawings) 186-189, 50
Interiors—French Details of Large Hall, Chateau de Montfermeil, Paris (Louis XIV) (measured drawings) 81-86
Details from Library, Hotel Gouthiere, Paris (measured drawings) 307-310
Details of Salons, Chateau de Monfermeil, Paris (Louis XIV) (measured drawings) 37-42
Loggias Fraternity Clubs Building, New York, N. Y. (It. Ren.) (measured drawings) 12, 13, 15, 3
Kingsley, Dr. W. S., Palm Beach, Fla. (Spanish) 28
Metal Work Cresting, Gateway, Berkeley's Hospital, Worcester, England 69, 70
Door Grille (Bronze) Third District Court, New York, N. Y. 32
Elevator Door, Bronze, Straus Building, Chicago, Ill. 108
Stair Balustrade, Deford, John E., Baltimore, Md. (Georgian) 53
Stair Balustrade, Fraternity Clubs Building, New York, N. Y. (It. Ren.)..... 4
Window and Entrance Grilles, Phoenix National Bank, Hartford, Conn. (Span. Ren.) (measured drawings) 186-189, 50
Writing Table, Bronze, Phoenix National Bank Hartford, Conn. 192
Wrought Iron Gate, Old Renaissance Garden, San Domenico, Florence (measured drawing) 297
Wrought Iron Gates, House, Myron C. Taylor, Locust Valley, N. Y. (Spanish)..162
Mural Decoration Ballroom Park Lane Hotel, New York, N. Y. 211
Ballroom, Roosevelt Hotel, New York, N. Y. 280
Decorative Frieze, Lodge Room, Masonic Temple, Birmingham, Ala. 172
Gladstone Apartment Hotel, New York, N. Y. (Chinese) 246
Phoenix National Bank, Hartford, Conn. (Enlarged Early Map of Hartford).....51
Paneling Madison Apartment Hotel, New York, N. Y. (Eng. Ren.) 229
Office, House of Miss Anne Morgan, New York, N. Y. (Georgian) 24
Stairways Deford, John E., Baltimore, Md. (Curved) 53
Fraternity Clubs Building, New York, N. Y. (It. Ren.) (measured drawing)..... 4
Kellogg, J. G., Winnetka, Ill. (Curved)....287
Park Lane Villa, Cleveland, Ohio (It.).....244
Potter, Alonzo, Smithtown, N. Y.....56
Roosevelt Hotel, New York, N. Y. (Col.)...281
Vanderbilt, Mrs. W. K., New York, N. Y. (Georgian) 19
Windows Belmont Hotel, Chicago, Ill. (Adam) 239
New Arrowhead Inn, New York, N. Y. (Florentine) 274

FABRICS

Decorative Acoustical Felts 193-196

Index to Articles According to Subject

Apartment Hotels Construction of Apartment Hotels, The 221
*Decoration and Furnishing of Public Rooms, The, Howard Major 243
*Decorative Treatment of Furnished Apartments, The, John H. Hutaff.....249
Economic Factors of an Apartment Hotel Project 213
*Efficiency Planning and Equipment, C. Stanley Taylor 253
*Food Service in Apartment Hotels, Albert E. Merrill 265
*Interior Architecture of Apartment Hotels, The, W. Sydney Wagner 237
*Lake Shore Drive and The Belmont Hotels, The, Chicago 217
*Mechanical Equipment of Apartment Hotels, J. F. Musselman 233
*Planning the Modern Apartment Hotel, S. Fullerton Weaver 205
*Special Equipment for Apartment Hotels, William L. Rouse 227
Architecture Architectural Precedent (Editorial) 204
*Architecture at the British Empire Exhibition, H. J. Birnstingl 29
*Evolution and Development of Jackson Heights, The 61
*Exterior Architecture of Office Buildings, Raymond M. Hood 97
*Interior Architecture of Apartment Hotels, The. W. Sydney Wagner 237
*Smaller Civil Architecture of England, The, Roger Wearne Ramsdell and Harold Donaldson Eberlein
Part 1. Wool Market, Chipping Campden, Gloucestershire 25
Part 2. Berkeley's Hospital, Worcester.....67
Part 3. County Sessions House, Warwick..173
*Spanish Influence at Palm Beach.....73
*Two Notable Houses on Sutton Place, N. Y. (Homes of Mrs. W. K. Vanderbilt and Miss Anne Morgan) 49
Associations American Construction Council Analysis of Building Conditions..July **Ser.** 67
American Engineering Standards Committee School Lighting Code Adopted..Oct. **Ser.** 71
American Institute of Architects Convention, 57th Annual (Editorial).....44
Membership Development Plan.....Aug. 39
Common Brick Manufacturers' Association, Definition of Brick .....Oct. **Ser.** 72
Philadelphia Building Congress Committee on Coordination of Maintenance and Repairs with new Construction Work .....Aug. **Ser.** 70
Banks *Phoenix National Bank, The, Hartford, Conn. 185
Bibliography Office Building Bibliography.....159
Building Codes School Lighting Code Adopted .....Oct. **Ser.** 71
Building Costs Analysis of Mid-Year Building Conditions .....Aug. **Ser.** 67
Building Costs Doubled in Last Ten Years .....July **Ser.** 69
Building Material Prices May 1, 1924, July **Ser.** 65; June 1, 1924, Aug. **Ser.** 65; Aug. 1, 1924, Oct. **Ser.** 67; Oct. 1, 1924, Dec. **Ser.** 99
Building Situation July **Ser.** 63; Aug. **Ser.** 63; Sept. **Ser.** 103; Oct. **Ser.** 65; Nov. **Ser.** 103; Dec. **Ser.** 97
Building Economics Analysis of Condition of the Building Industry (Guaranty Trust Co. Survey) .....July **Ser.** 68
Analysis of Mid-Year Building Conditions .....Aug. **Ser.** 67
Builders' Hardware, Simplification of..... .....Aug. **Ser.** 69
Builders Study Employment Conditions in Milwaukee .....Oct. **Ser.** 72
Building Costs Doubled in Last Ten Years .....July **Ser.** 69
Building Situation July **Ser.** 63; Aug. **Ser.** 63; Sept. **Ser.** 103; Oct. **Ser.** 65; Nov. **Ser.** 103; Dec. **Ser.** 97
Coordination of Building Maintenance with New Construction Work Committee appointed by Philadelphia Building Congress .....Aug. **Ser.** 70
Department of Commerce Report on Recommended Minimum Requirements for Plumbing in Dwellings and similar buildings .....July **Ser.** 69
Economic Factors of an Apartment Hotel Project 213
Economic Factors of the Office Building Project, Leo J. Sheridan 121
Forecast of Construction Conditions for Remainder of 1924 .....Oct. **Ser.** 72
Financing the Office Building, C. Stanley Taylor 137
Housing Problem, The (Editorial) 88
Office Building and The City, The, Earle Shultz 141
Prospective Activity in Architects' Offices, C. Stanley Taylor 197
Standardization of Hollow Building Tile, ...Oct. **Ser.** 70
Trend of Building Activity—Monthly Analysis of July **Ser.** 64; Aug. **Ser.** 64; Oct. **Ser.** 66; Dec. **Ser.** 98
Buildings, Description of *Alterations at Underhill Farm, The, Chester L. Churchill 161
*Federal Building, The, Honolulu.....21
*Fraternity Clubs Building, The..... 9
*House of Dr. P. S. Chancellor, Millbrook, N. Y. 177
*House of J. G. Kellogg, Winnetka, Ill....285
*Lake Shore Drive and Belmont Hotels, The 217
*"Little Orchard" House of Mrs. Laura Levering, Greenwich, Conn.....289
*New Arrowhead Inn, The, Matlack Price..269
*Phoenix National Bank, The.....185
*Remodeled Masonic Temple, Birmingham, Ala. 169
*Roosevelt Hotel, The 277
*Some Recent Office Buildings in San Francisco, William C. Hays.....101
*Spanish Influence at Palm Beach (Houses of Addison Mizner and Dr. W. S. Kingsley) 73
*Two Notable Houses on Sutton Place, N. Y. (Homes of Mrs. W. K. Vanderbilt and Miss Anne Morgan) 49
*West Virginian Hotel, The, Bluefield, West Va. 181
Competitions Awards, 17th Paris Price, Society of Beaux Arts Architects.....Oct. 41
House Beautiful Cover Competition....Nov. 49
Results of Country Life Competition....Nov. 49
Concrete Use of Composite Columns in Concrete Buildings, Joseph W. Parker.....77
Construction Construction of Apartment Hotels 221
The Forecast of Construction Conditions for Remainder of 1924 .....Oct. **Ser.** 72
Conventions Fifty-seventh Convention, American Institute of Architects (Editorial).....44
Design *Alterations at Underhill Farm, The, Chester L. Churchill 161
Architectural Precedent (Editorial).....204
*Classic Influence in Louis XIV Interiors C. Hamiton Preston
Details of the Salons, Chateau de Montfermeil, Paris 36
Details of the Large Hall, Chateau de Montfermeil, Paris 81
*Decoration and Furnishing of Public Rooms, The, Howard Major 243
*Decorative Coverings for Acoustical Materials, Claxton B. Moulton 193
*Decorative Treatment of Furnished Apartments, The, John H. Hutaff.....249
*Description of Contents—New American Wing of Metropolitan Museum (Editorial) 312
Design of a Truss with Parallel Chords, The, Charles L. Shedd 301
*Details from the Library of the Hotel Gouthiere, Paris 307
*Efficiency Planning and Equipment, C. Stanley Taylor 253

*Evolution and Development of Jackson Heights, The 61
*Exterior Architecture of Office Buildings, Raymond M. Hood 97
*Interior Architecture of Apartment Hotels, The, W. Sydney Wagner.....237
*Notes on Planning of Grounds and Buildings, George Howe 45
*Office Building Vestibules, William F. Lamb 105
*Office Buildings, The Planning of, Harvey Wiley Corbett 89
*Office Interiors, John Taylor Boyd, Jr.....143
*Planning the Modern Apartment Hotel, S. Fullerton Weaver 205
*Renaissance Garden at San Domenico, Florence, Roger Wearne Ramsdell and Harold Donaldson Eberlein 293
*Spanish Influence at Palm Beach (Houses of Addison Mizner and Dr. W. S. Kingsley) 73
*Special Equipment for Apartment Hotels, William L. Rouse 227
*Two Notable Houses on Sutton Place, New York (Homes of Mrs. W. K. Vanderbilt and Miss Anne Morgan) 49
Education Award of Booth Scholarship, University of Michigan .....Aug. 39
Beaux Arts (Early History) .....Aug. 39
Changing Educational Tendencies .....Dec. 41
Course in Landscape Architecture at U. of P. .....July 39
Rotch Traveling Scholarship .....Aug. 39
Electrical Electric Power Club Handbook .....Nov. 49
Location of Light Sources .....July **Ser.** 70
Engineering Design of a Truss with Parallel Chords, The, Charles L. Shedd 301
Dust Work in Connection with Ventilation, C. W. Kimball 33
Electric Power Club Handbook.....Nov. 49
Eliminating Fire Hazards in Office Buildings, Rudolph P. Miller 117
*Four-Story Substructure for a Steel Building, Frank W. Skinner 111
How Proper Insulation Cuts Fuel Costs One-Third .....Aug. **Ser.** 70
Location of Light Sources .....July **Ser.** 70
*Mechanical Equipment of Apartment Hotels, J. F. Musselman 233
Mechanical Equipment of Office Buildings, The, Clyde R. Place 147
*Modern Office Building Appliances, B. H. Belknap 155
Placing Structural Responsibility Aug. **Ser.** 69
Use of Composite Column in Concrete Buildings 77
Exhibitions Chicago Architectural Exhibition League .....Nov. 49
Montreal—Exhibition of French Architecture in Quebec .....Nov. 49
Thumb Tack Club—4th Annual Architectural Exhibition .....Nov. 49
Work of Bertram Grosvenor Goodhue..Aug. 39
Hotels *Roosevelt, The, New York, N. Y....277
*West Virginian Hotel, The, Bluefield, West Va. 181
Labor New York Y. M. C. A. Trade Schools .....July 39
Builders Study Employment Conditions in Milwaukee .....Oct. **Ser.** 72
Landscape Architecture *Notes on Planning of Grounds and Buildings, George Howe.....45
*Style and Expression in Landscape Architecture, Charles Downing Lay 1
University of Pennsylvania Course in Landscape Architecture .....July 39
Materials Aluminate Cement—Description, Cost and Advantages of (Contract Record and Eng. Review) .....Oct. **Ser.** 69
An American Alumina Cement (Eng. News-Record) .....Oct. **Ser.** 71
Brick—Definition of .....Oct. **Ser.** 72
Builders' Hardware, Simplification of..... .....Aug. **Ser.** 69
*Decorative Coverings for Acoustical Materials, Claxton B. Moulton.....193
Materials and Maintenance, Edward Van Vleck 119
Plumbing Fixtures—Wholesale Prices of, ...Oct. **Ser.** 72
Simplification and Standardization of Building materials.....Oct. **Ser.** 72
Specifications for Glazing Glass..Oct. **Ser.** 72
Standardization of Hollow Building Tile, ...Oct. **Ser.** 70
Obituaries Hunt, Joseph Howland, ...Dec. 41
Ives, Frederick Walter .....Oct. 41
*MacDonald, Albert James.....Sept. 49, 50
Office Buildings Architect and the Building Manager, The, William Marshall Ellis.....135
Economic Factors of the Office Building Project, Leo J. Sheridan.....121
Eliminating Fire Hazards in Office Buildings, Rudolph P. Miller 117
*Exterior Architecture of Office Buildings, Raymond M. Hood 97
Financing the Office Building, C. Stanley Taylor 137
Materials and Maintenance, Edward Van Vleck 119
Mechanical Equipment of Office Buildings, The, Clyde R. Place 147
*Modern Office Building Appliances, B. H. Belknap 155
Office Building and The City, The, Earle Shultz 141
*Office Building Problem in New York, The, Ely Jacques Kahn 94
*Office Building Vestibules, William F. Lamb 105
Office Buildings, Past, Present and Future, Clarence T. Coley 113
*Office Interiors, John Taylor Boyd, Jr....143
*Planning of Office Buildings, The, Harvey Wiley Corbett.....89
*San Francisco, Some Recent Office Buildings in, William C. Hays.....101
Office Practice Architect and the Law, The, Leslie Childs..... 17
Placing Structural Responsibility, Aug. **Ser.** 69
Restaurants *New Arrowhead Inn, The, Matlack Price 269
Ventilation Duct Work in Connection with Ventilation, C. W. Kimball.....33
Zoning Progress of Zoning, The, ...Oct. 41

Index to Illustrations According to Architect

A

Alschuler, A. S., London Guarantee & Accident Bldg., Chicago, Ill., ex. in. pl.....**38-40**
Armstrong, John Archibald, Solarium, Sagamore Hotel, Rochester, N. Y., in.....237
Atterbury, Grosvenor, New American Wing, Metropolitan Museum, New York, ex.....312

B

Bakewell & Brown, Pacific Gas & Electric Bldg., San Francisco, Cal., ex.....103
Barnum, Phelps, "Little Orchard," House of Mrs. Laura Levering, Greenwich, Conn., ex. in. pl. 289-292
Baum, Dwight James, New Arrowhead Inn, New York, ex. in. pl.....269-276
Bradshaw, Preston J., Melbourne Hotel, St. Louis, Mo., ex. in. pl.....**65, 66**
Bellerive Apartment Hotel, Kansas City, Mo., ex. in. pl.....**67, 68**
Brown & Whiteside, House, Dr. Harold L. Springer, Rockland, Del., ex. pl.....**79, 80**
Buchman & Kahn, Office Building, 24 West 40th St., New York, ex.....94
Bouzan Building, New York, ex.....95
Garment Building, New York, ex. 95
Arsenal Building, New York, ex.....96
Directors' Room & President's Room, Borden Building, New York, in.....144

C

Cantin, A. A. (See Miller, J. R. & Pfleuger, T. L.).
Carrere & Hastings, Standard Oil Building, New York, ex. in. .....Frontis, 106, 107
Chatten & Hammond, House, J. G. Kellogg, Winnetka, Ill., ex. in. pl.....285-288
Clement, Merrell (See Green, Edward B. & Sons, Inc.)
Coolidge & Shattuck, Boston Insurance Exchange, Boston, Mass., ex. pl.....**41, 42**
Cross & Cross, Postum Building, New York, ex. pl. 110
Knapp Buildings, New York, ex. pl.....133

D

De Golyer, Robert S. & Co., Pearson Hotel, Chicago, Ill., ex. in. pl.....224-226, 266
Denham, Van Keuren & Denham, Highland Plaza Apartments, Birmingham, Ala., ex. pl. 259
Dennison & Hirons, Phoenix National Bank, Hartford, Conn., ex. in. pl.....185-192, **49-51**
De Vos, K. M. & Co., Alden Park Manor, Brookline, Mass., ex. pl. (Harold Field Kellogg & George R. Wiren, Consulting Archts.) 260
Dickey, Charles William, Pacific Gas & Electric Bldg., Oakland, Cal., ex. pl.....134

F

Fisher, W. E. & A. A., U. S. National Bank Bldg., Denver, Col., ex. pl.....140
Fowler, Laurence Hall, House, John E. Deford, Baltimore, Md., ex. in. pl.....203, **52, 53**
French, Leigh, Jr., President's Office, American Press Ass'n., New York, in.....143
Fugard & Knapp, Lake Shore Drive Hotel, Chicago, Ill., ex. in. pl.....217, 218, 240, **59, 60**
Belmont Hotel, Chicago, Ill., ex. in. pl. (Warren & Wetmore, Consulting Architects) 219, 220, 238, 239 **57, 58**

G

Gilchrist, Edmund B., House, Ernest S. Ballard, Hubbard's Woods, Ill., ex. in. pl....**46-48**
Graham, Anderson, Probst & White, S. W. Straus & Co. Building, Chicago, Ill., ex. in. pl. 108, **44**
Green, Edward B. & Sons, Inc., Genesee Building, Buffalo, N. Y. ex. in. pl. (Merrell Clement, Associated).....**45, 46**
Guilbert & Betelle, Chamber of Commerce Building, Newark, N. J., ex. in. pl.....**77, 78**

H

Helmle & Corbett, Bush Terminal Building, London, England, ex.....92, 93, 160
Hinsdale, Reynold H., Park Lane Villa, Cleveland, Ohio, ex. in. pl.....244, **71, 72**
Hobart, Lewis P., Alexander Building, San Francisco, Cal., ex., pl.....102
Hood, Raymond M., Tribune Tower Building, Chicago, Ill., ex. pl. (John M. Howells, Associated) 100
American Radiator Co. Building, New York, ex. in. pl.....105, **43**
Hopkins, Alfred, Third District Court, New York, ex. in. pl.....87, **31, 32**
Hornbostel, H. & Fisher, Eric Wood, Schenley Apartments, Pittsburgh, Pa., ex. pl. 241, 242
Howells, John M., Tribune Tower Building, Chicago, Ill., ex. pl. (Raymond M. Hood, Associated) 100

J

Jeffery, H. T. & Son, Alcazar Hotel, Cleveland, Ohio, ex. in. pl.....244, **63. 64**

K

Kahn, Albert, City Editor's Room, Library & Editorial Room, Editor's Office, Evening News Building, Detroit, Mich., in.....145, 146
Kelham, George W., Standard Oil Building, San Francisco, Cal., ex. pl.....101, **33, 34**

L

Ludlow & Peabody, Johns-Manville Building, New York, ex. pl.....109

M

MacVicar & Heriot, New Caron Building, Montreal, Canada, ex. pl.....158
Mahood & Van Dusen, West Virginian Hotel, Bluefield, West Va., ex. in. pl.....181-184
Maynicke & Franke, Concourse Plaza Apartments, New York, ex. in. pl.....247, 248
McKenzie, Voorhees & Gmelin, Municipal Building, Brooklyn, N. Y., ex. pl.....153
Miller, J. R. & Pflueger, T. L., Pacific Telephone & Telegraph Co. Building, San Francisco, Cal., ex. pl. (A. A. Cantin, Associated) 115
Mizner, Addison, House, Dr. W. S. Kingsley, Palm Beach, Florida, ex. in. pl. 73, 75, 76, **27, 28**
House, Addison Mizner, Palm Beach, Florida, ex. in. pl....., **25, 26**
Morgan, Walls & Clements, Bank of Italy Building, Los Angeles, Cal., ex. in. pl....**35-37**
Morris, Benjamin Wistar, Entrance Foyer, Cunard Building, New York, in.....107

M

Murgatroyd & Ogden, Fraternity Clubs Building, New York, ex. in. pl.....9-16, **1-8**

P

Peabody, Wilson & Brown, House, Alonzo Potter, Smithtown, N. Y., ex. in. pl..203, **54-56**
Pelham, George F., Rooms in Gladstone Apartment Hotel, New York, in.....245, 246
Perry, Shaw & Hepburn, St. Paul's Church, Newburyport, Mass., ex. in. pl. (Office of R. Clipston Sturgis, Consulting Architect) **29-30**
Post, George B. & Sons, Fenway Hall, Cleveland, Ohio, ex. in. pl.....231, 232
Roosevelt Hotel, New York, ex. in. pl .....Frontis, 278-284, **73-76**

R

Ray, George N., Semmes Building, Washington, D. C., ex. pl.....154
Richardson, Barott & Richardson, "Underhill Farm," Estate of Myron C. Taylor, Locust Valley, N. Y., ex. in. pl.....162-168
Ross & MacDonald, Keefer Building, Montreal, Canada, ex. pl **48**
Rouse & Goldstone, The Madison Apartment Hotel, New York, ex. in pl.....227-230, 243

S

Schenck & Williams, Ashland National Bank Bldg., Ashland, Ky., ex. pl.....142
Schmidt, Mott B., House, Miss Anne Morgan, New York, ex. in. pl.....49, 58, 59, **18, 22-24**
House, Mrs. W. K. Vanderbilt, New York, ex. in. pl.....50-58, 60, **17, 19-21**
Schultze & Weaver, Park Lane Hotel, New York, ex. in. pl.....206-212
Smith, Edward C., House, Dr. P. S. Chancellor, Millbrook, N. Y., ex. in. pl.....177-180
Smith, Hinchman & Grylls, Buhl Building, Detroit, Mich. ex. pl.....116
Starrett & Van Vleck, Westinghouse Building, New York, ex. pl.....**47**
Strickland, Blodget & Law, Sheraton Apartment Hotel, Boston, Mass., ex. in pl.....69, 70
Sturgis, R. Clipston (See Perry, Shaw & Hepburn)

T

Thomas, Andrew J., Apartments at Jackson Heights, New York, ex. pl.....61-66

W

Walker & Eisen, Gaylord Apartments, Los Angeles, Cal., ex. in. pl.....263, 264
Warren, Knight & Davis, Masonic Temple, Birmingham, Ala., (Henry B. Wheelock, Associated), ex. in. pl.....169-172
Warren & Wetmore, Royal Bermudiana Hotel, Hamilton, Bermuda, ex. in. pl.....**13-16**
Weeks & Day, Huntington Apartments, San Francisco, Cal., ex. in. pl.....**61,.62**
Wheelock, Henry B. (See Warren, Knight & Davis).
Wunder, Clarence E., Hotel Pennsylvania, Philadelphia, Pa., ex. in. pl.....261, 262

Y

York & Sawyer, Federal Building, Honolulu, Hawaii, ex. pl. 21-24

***Illustrated; ex. exterior; in. interior; pl. plan.** See key to determine month on page ii

THE ARCHITECTURAL FORUM

VOLUME XLI NUMBER 1

CONTENTS for JULY 1924

PLATE ILLUSTRATIONS	Architect	Plate
FRATERNITY CLUBS BUILDING, NEW YORK	*Murgatroyd & Ogden*	1- 8
BRITISH EMPIRE EXHIBITION		9
FRENCH EXPOSITION, GRAND CENTRAL PALACE, NEW YORK	*Howard Greenley*	10-12
HOTEL ROYAL BERMUDIANA, HAMILTON, BERMUDA	*Warren & Wetmore*	13-16

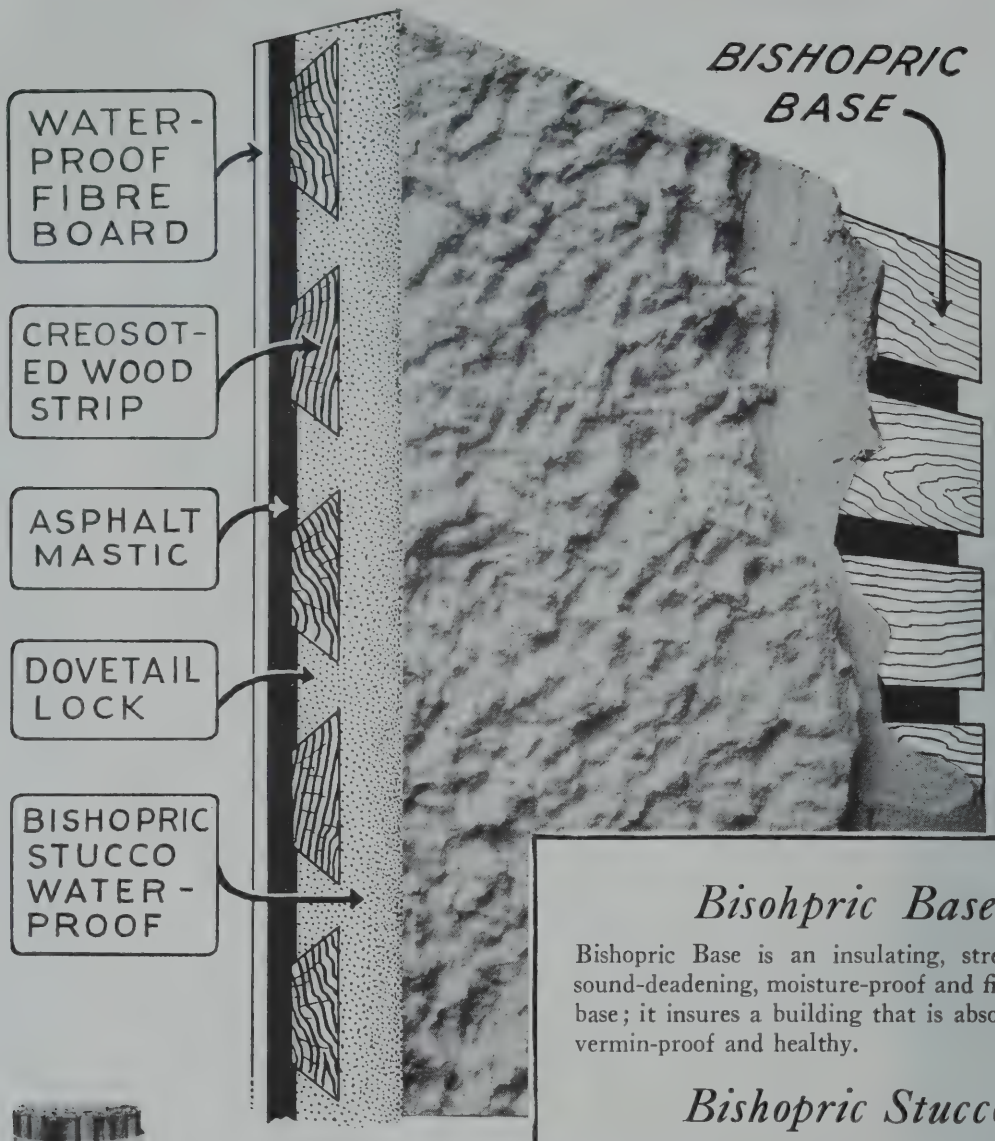
LETTERPRESS	Author	Page
COVER, MAIN ENTRANCE, THE OCTAGON, WASHINGTON	*Louis C. Rosenberg*	
THE EDITOR'S FORUM		39
A CHURCH TOWER IN ANGOULEME	*From Lithograph by J. R. Rowe*	Frontispiece
STYLE AND EXPRESSION IN LANDSCAPE ARCHITECTURE	*Charles Downing Lay*	1
FRATERNITY CLUBS BUILDING, NEW YORK		9
THE ARCHITECT AND THE LAW	*Leslie Childs*	17
FEDERAL BUILDING, HONOLULU	York & Sawyer, Architects	21
SMALLER CIVIL ARCHITECTURE OF ENGLAND I. The Wool Market, Chipping Campden	*Roger Wearne Ramsdell and Harold Donaldson Eberlein*	25
ARCHITECTURE AT THE BRITISH EMPIRE EXHIBITION	*H. J. Birnstingl*	29
DUCT WORK IN CONNECTION WITH VENTILATION	*C. W. Kimball*	33
DETAILS OF SALONS, CHATEAU DE MONTFERMEIL, PARIS	*C. Hamilton Preston*	36
PLATE DESCRIPTION		43
EDITORIAL COMMENT		44

57th Annual Convention, American Institute of Architects

ALBERT J. MacDONALD, Editor
PARKER MORSE HOOPER; PAUL W. HAYES, Associate Editors

Published Monthly by
ROGERS AND MANSON COMPANY
383 Madison Avenue, New York
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada.....$6.75 Foreign Countries in the Postal Union, 7.50
Single Copies.....60 cents All Copies Mailed Flat
Trade Supplied by American News Company. Entered as Second Class Matter at the Post Office, New York, N. Y., under the Act of March 3, 1879.
Copyright, 1924, by Rogers and Manson Company

Albert J. MacDonald, *President and Treasurer*
Robert Sweet, *Secretary*
Howard Myers, *Vice-president*
C. Stanley Taylor, *Vice-president*



The Roll and the Drum

Bishopric Base is shipped in rolls 100 square feet to the roll. It is easily handled, quickly cut to desired size and there is no waste.

Bishopric Stucco is packed in airtight metal drums preventing deterioration and loss, either in transit or storage, or on the job.

Bisohpric Base

Bishopric Base is an insulating, strengthening, sound-deadening, moisture-proof and fire-resistant base; it insures a building that is absolutely dry, vermin-proof and healthy.

Bishopric Stucco

over Bishopric Base is water-proof and fire-proof. No contraction or expansion. All the elements of wear and tear have been anticipated in the manufacture of BISHOPRIC.

Booklet "Bishopric For All Time and Clime," beautifully illustrated, sent upon request.

Plan Book containing many attractive designs with floor plans will be sent upon receipt of 25c, coin or stamps.

Bishopric Is Sold by Dealers Everywhere.

The BISHOPRIC MANUFACTURING Co.
103 ESTE AVE. CINCINNATI, OHIO.
NEW YORK CITY CINCINNATI OTTAWA, CANADA

The BISHOPRIC MFG. CO. OF CALIFORNIA
LOS ANGELES

BISHOPRIC

Stucco Over Bishopric Base

THE PLACE DU MURIER, WITH THE TOWER OF THE CHURCH OF ST. ANDRE, AT ANGOULEME

FROM LITHOGRAPH BY J. R. ROWE

BOOK DEPARTMENT

The Modern English Small House

FOR centuries the English have excelled in giving to their architecture a character which is definitely and unquestionably English. The genesis of their Gothic may have come from France and their Queen Anne may have been inspired if not imported from Holland, but when once appropriated a type was changed, modified and worked over until its character ceased to be French, Dutch or Italian and was essentially English. In no field have English architects and builders been more unfailingly successful than in that of domestic architecture, and to narrow the field still further, in their small house or cottage architecture. Indeed the English cottage has been famous ever since the annals of British architecture were first recorded, and in every age, from that of Shakespeare to the present, writers have written of the English hearthstone — not so much that of the castle as of the small manor, the farmhouse or the better class of cottages.

A House at Hampstead Garden
Welch & Hollis, Architects
An Illustration from "The Smaller House"

The "modern English style," or what is now being called by that name, while borrowing from many architectural types cannot be said to belong to any. It makes use of many materials and indeed has been formulated with a view to using certain building materials of modern invention; its design is straightforward and its plan simple. It is quaint without being freakish, and picturesque in the best sense of the word without being exaggerated or affected. It is in fact homelike and appropriate, and being appropriate it might be said to be merely the present century's version of what was current in England during the era of Queen Elizabeth or the period of George III. It is representative of the present stage of an architecture which is in constant evolution. The type, indeed, well expresses the characteristics which have always distinguished English architecture—solidity, a considerable degree of dignity, reserve which sometimes approaches what seems to be reticence, and above all a clothing of utility with an attractive garb, which suggests one definition of architecture—"the art of building beautifully."

Into this volume there have been gathered illustrations, exterior and interior, of quite a number of houses of what in America we should call "moderate size," together with some smaller houses and a few which seem to definitely and unquestionably qualify as "bungalows," and among the names of architects whose work is illustrated are many of the foremost among English practitioners of domestic architecture. The houses are all of the modern English type and are fully representative of the breadth or range which the style affords, built of brick, stone, stucco on various bases, frame, and combinations of all these, while roofs are of materials such as would be used in America, with the addition of actual "thatch" which is entirely beyond our reach. The plans of the houses are simple and direct, as plans of modern English houses should be, and include in each instance rooms which while few in number are of fair sizes, all this being just about what obtains in the United States at present.

Illustrations of interiors are numerous and show arrangements of interior architecture and disposition of furniture and decorations which are pleasing and full of helpful suggestions without being widely different from what would be found in houses of like sizes and character in the suburbs of almost any American city. What is particularly admirable in the book is the number of illustrations and plans of gardens in connection with the houses, the houses and the gardens being so disposed that they sustain definite relations to each other, but this delightful detail of planning the English taught us long ago, and we have not been altogether backward in profiting by their excellent teaching. What someone has called "the Communism of Architecture" in America has brought into use motifs from many countries and of many periods, as a survey of our suburbs would show. Many of these types are appropriate for the frequent use which is being made of them, though few are more suitable than this type which has been evolved by present-day English architects as a setting for life much similar to what obtains in America.

2483

The work upon the whole is an excellent presentation of an architectural type in which Americans are manifesting increasing interest and which is highly practical.

THE SMALLER HOUSE. Being Selected Examples of the Latest Practice in Modern English Domestic Architecture. 191 pp., 10 x 12 ins. Fully illustrated with half-tones. Price $7.20. The Architectural Press, 9 Tothill Street, Westminster.

Interiors and Interior Decoration

Recent constructive and practical works on Interior Architecture

English Decoration and Furniture of the Later 18th Century

By M. Jourdain

An excellent presentation of work of the period, and particularly of what is comparatively moderate in scale and cost. The volume deals with architecture, decoration and furniture of types which have attained a permanent popularity in America.

269 pp., 10½ x 13¾ inches.

Price, $25

The Davanzati Palace

By Louis Conrad Rosenberg

Illustrations from recent photographs of the various rooms of the palace, and working drawings of every detail in which architects or interior decorators would be interested, such as bases, columns, capitals, mouldings and corbels; mantels, beamed and coffered ceilings, door and window trim, paneled doors and inner blinds or shutters; wrought iron bolts, hinges, knockers and escutcheons. The most complete and useful work on the Davanzati Palace.

70 pp., 10½ x 13½ inches.

Price, $10

Colonial Interiors

By Leigh French, Jr.

Invaluable to architects interested in the correct development of the Colonial interior, since it includes many working drawings of wall paneling, mantels and over-mantels, door and window trim, china closets and stairways. Simple as well as more elaborate work is included, and only old work is illustrated.

125 plates, 9½ x 13 inches.

Price, $15

The Art and Business of Interior Decoration

By B. Russell Herts

Written by a successful and well established New York interior decorator on the artistic and business aspects of decoration. It discusses some of the business problems, and treats of the decoration and furnishing of private houses and apartments as well as of hotels, restaurants, theaters and other public or semi-public places.

134 pp., 7¾ x 10¼ inches.

Price, $5

Architecture of Robert and James Adam

By Arthur T. Bolton

This excellent work is among the best on the subject, for it sums up the work of the Adam brothers in the field of small or medium-sized domestic architecture and decoration. Valuable for its floor plans and illustrations of little known interiors.

2 Volumes, 10½ x 15½ inches. 800 pp. and about 700 illustrations, plans and drawings.

Price, $60

Some 18th Century Designs for Interior Decoration

A work rich with suggestion for the architect or interior decorator working in the later English periods. Based on the work of Abraham Swan, the volume contains many drawings of wall treatments for rooms of different sizes, their paneling, mantels, door and window trim and other details.

Text and 76 plates, 10½ x 15½ inches.

Price, $7.50

Redeeming Old Homes

By Amelia Leavitt Hill

A valuable work on the alteration and restoration of country houses. Particular attention has been given to the planning of interiors and to the decoration and furnishing of the different rooms.

160 pp., 5½ x 8¼ inches.

Price, $3

Colonial Lighting

By Arthur H. Hayward

The important subject of lighting Colonial houses is studied. The various forms of lighting fixtures used during early and later Colonial times are illustrated and described, with particular emphasis given the later period.

159 pp., 6 x 9 inches.

Price, $7.50

Character in any building is largely dependent upon the design of its interior architecture and the handling of its decorations. The growing importance of this part of an architect's practice warrants close study of interior design and decoration with which these works deal.

ROGERS & MANSON COMPANY
383 Madison Avenue
New York

ENGLISH FURNITURE; ITS ESSENTIALS AND CHARACTERISTICS. By John C. Rogers, A.R.I.B.A. With foreword by H. Avray Tipping, M.A., F.S.A. 188 pp. 6 x 9 ins. 150 illustrations and diagrams. Price $7.50. Charles Scribner's Sons, New York.

THE interest in English furniture which is increasing each year is accompanied by the publication of many works which deal with the subject from such varied and differing points of view as that of the antiquarian, the dealer, the architect or interior decorator, and the collector. It is true that whatever be one's direct interest in the subject, study of English furniture involves the consideration of much the same subject matter,—the following of one of the great historic periods of furniture-making closely upon the heels of another, the varying forms and different woods used, and the relations which the furniture of the various periods sustained to the interior architecture of the houses themselves and to the customs of the people who lived in them.

Many of the works published to aid in studying English furniture are given up so largely to discussing matters which while interesting themselves do not relate directly to the subject that their value to the furniture student is rather lessened, and almost all these volumes, owing to their sizes and to the luxurious form in which they are brought out, are likely to be beyond the reach of the very students who would profit most by possessing them.

This volume is of a character which will interest classes as varied as students, collectors, architects or decorators, and practical cabinet makers, particularly designers and draftsmen engaged on working drawings for the reproducing of old furniture. The excellence of the illustrations should be of inestimable value in avoiding the false note which is so frequently struck, to the complete ruin of so much work of this type today.

The story of English furniture has been frequently and ably told and illustrated, but extremely little has been presented upon the practical side; yet questions of material and construction are valuable to the collector and even more valuable to the workman who is reproducing old English furniture, the neglect of subtle but important details often being responsible for the lack of character or feeling which these reproductions so frequently display. We do not know of many works on this subject where so much of value is given in small compass. Excellent half-tone illustrations accompany exceedingly well written text, but by far the most valuable detail is the drawings, of which there are a great number, illustrating such important details as the various forms of the cabriole leg; stretchers of chairs, tables and other pieces; cornices and profiles on tables, secretaries and wall pieces of different kinds, and numerous drawings, of such items as dove-tailing, tripod tables and stands, drawer construction and turned spindles.

A HISTORY OF ORNAMENT. Volume II., Renaissance and Modern. By A. D. F. Hamlin. 521 pp., 6 x 9 ins., 430 illustrations, with 4 in color. Price $5. The Century Co., New York.

THIS valuable volume might be best described by saying that it is a companion and sequel to the well known work by the same author on "History of Ornament, Ancient and Mediæval." This later work follows much the same general plan as the earlier volume, but it discusses the motifs and the style of ornament as they have been developed in Europe and America during the modern period, and as Mr. Hamlin observes in the preface, not with the work of civilizations long dead but with work of our own times or at least of a period of which our own time is the child and direct heir. The age of the Renaissance is a period from which we are separated in time rather than in character, culture and sympathy. We fall naturally into ways of thinking and ways of designing taught us by the whole movement of the Renaissance, and the ornament of that age is therefore full of suggestion, inspiration and example for present-day use.

Planning the work in some 15 chapters, the author discusses under each heading the ornament which is identified with that period, ornament of every description, not only what is strictly architectural, but also what is applicable to furniture, fabrics, pottery of many different kinds, glass, metalwork and almost everything else for which ornament could well be used. Illustrations, which are numerous, have been selected with great taste and care, and since many are in full color the student of design obtains some idea of the importance of the use of color as applied to ornament. Even the comparatively recent art movements receive due recognition in the discussion of ornament, considerable attention being given to the development in different European countries of the "art nouveau" movement and the more recent revival of interest in America of the late Georgian type of ornament which is so much used today.

THE BOOKPLATE ANNUAL FOR 1924. Edited by Alfred Fowler. 58 pp., 9½ x 12½ ins. Price $5. Alfred Fowler, Board of Trade Building, Kansas City.

A BOOKPLATE frequently possesses a value as an excellent example of some form of graphic art as well as a utilitarian value in establishing the ownership of a book. The several centuries during which *ex libris* labels have been in vogue have seen the use of vast numbers of bookplates, interesting as being indicative of the pursuits, tastes and hobbies of their owners, and affording opportunity of expression which is not always given even in the selection of the volumes which the labels adorn. Many of the most interesting bookplates have always been those of architects, and an interesting study might be made of architects' bookplates alone.

Collectors of bookplates are more numerous than might be supposed, and in addition to various periodicals which cater to the interests of collectors there appears each year *The Bookplate Annual,* the volume for 1924 having just been issued. Replete with reproductions of bookplates of various types, the *Annual* contains an essay by Gardner Teall on "The Art of Sidney L. Smith," a number of whose bookplates are shown, and articles entitled "Bookplates as Works of Art," by Ralph M. Pearson; "Sidney Hunt's Bookplates," by James Guthrie; an illustrated catalog of the Ninth Annual Exhibition of Contemporary Bookplates; a new and enlarged Directory of Bookplate Artists, and a revised Exchange List of Bookplate Collectors. The volume possesses an interest which is manifold, for in addition to the presentation of countless designs of bookplates it affords suggestions which might well lead to the production of many more, and the volume is beautifully printed and bound and made in an interesting form.

HISTORIC TEXTILE FABRICS By Richard Glazier, Headmaster of the Municipal School of Art, Manchester, and Author of "A Manual of Historic Ornament." 122 pp., 6½ x 10 ins. Price $8 net. B. T. Batsford, Ltd., London; Charles Scribner's Sons, New York.

STUDENTS of design find that a great part of the subject matter with which their researches have to do is supplied by textiles of different kinds. The nations of ancient and mediæval times, with all their pomp and splendor, developed many arts and crafts in which design played an important part, but perhaps none of these arts was so indissolubly bound up with the industrial, civic and religious life of the people as the art of weaving, which in its different forms supplied hangings for the interior, fabrics for countless other domestic uses, and material for apparel, not only during life but also for clothing for burial of the bodies of the dead. The very extent to which weaving entered into the lives of all peoples, ancient or modern, is doubtless the cause of the existence after many centuries of textiles of various kinds, in making which the matter of ornament or design was of great importance. Thus along with the weaving of the simplest of linen or cotton cloths there went the making of the famous Mosul fabric, sometimes called "woven air," the famed woolen shawls of Cashmere, the magnificent cloth of gold from Bagdad, and the sumptuous velvets of Venice, Florence and Genoa.

Since the world as a whole has grown quieter, more gray and subdued than in the glorious days when these resplendent fabrics were in frequent use, the textiles, such as still exist, have been garnered for the most part into the collections of great museums, where in addition to being safe, they aid in promoting the study of design.

This volume discusses the study of textile design of periods both ancient and modern, and since the subject by reason of its very nature depends very largely upon illustration in order to be understood, the illustrations are as complete and as lavish as could be wished. The author's treatment of the design used in western Europe is extremely well done, and the mediæval and Renaissance fabrics of Italy, France and England are made the subjects of full and helpful chapters, with a particular study of the textiles of Spain, into the design of which there entered so much Moorish influence. An important part of this valuable volume on textile design is that devoted to fabrics in which the ornament is not produced while the textile is being woven upon a loom but by printing upon a fabric already woven. Since the topic being discussed is design, and since design is to some extent at least independent of processes, Mr. Glazier writes of the design of the printed cottons of the East and the printed fabrics of various kinds developed in Europe and indeed still being made today.

Knowledge of design is not likely to be easily or quickly acquired. It presupposes considerable study and training in the various arts of which design is so fundamental a part, but a student not only of textiles but of any of the liberal arts would be greatly benefited by careful study of this important work. The illustrations are for the most part of fabrics which to most students would be inaccessible, and the cuts themselves are of a character which bring out the delicacy of the detail, a number of the more important being in full color. A really valuable and excellent work which deserves careful study at the hands of all students of design.

Cottages, Farmhouses and Other Minor Buildings

In England of the 16th, 17th and 18th Centuries

By LOUIS CONRAD ROSENBERG

OF ALL the architectural types, that most appropriate for American domestic use is often thought to be that of the old English cottage or farmhouse. It can be easily developed in materials of almost every kind; it possesses wide flexibility as to scale, and the character of its fenestration provides the ample wall spaces which many designers highly value for their architectural effect. Its interior is readily developed to provide the rambling type of plan which is popular for country or suburban domestic buildings, and all in all, the English farmhouse or cottage answers every demand made by the modern home builder in the search for a practical type.

THIS important work presents half-tone illustrations from photographs or sketches of more than 100 English country houses of the cottage or farmhouse types, chiefly in the Cotswolds and in Sussex, Suffolk and Kent. It deals with the work of three centuries and illustrates buildings of several widely different kinds of old English domestic architecture, built of wood, plaster, stone, brick, or combinations of all these. There are also given countless detailed working drawings of doorways; oriel windows; gables; chimneys, singly or grouped in stacks; decorated plaster; half-timber work; fireplaces and cornices. A book invaluable to the architect.

102 pages, 10 x 13½ inches. Bound in cloth. Price $15.

ROGERS & MANSON COMPANY - - 383 Madison Avenue, New York

THE EDITOR'S FORUM

TRADE SCHOOL HELPS BUILDING

THE "Help Wanted" advertisements in city newspapers still call for skilled workers in the building trades at large wages, and both employers and organized labor are trying to find ways to meet the shortage. A part of the problem has been solved by the New York West Side Y. M. C. A. Trade Schools, which started more than a year ago with courses in bricklaying, tile setting and plastering, and have succeeded in giving training to over 1,400 students. The primary purpose of these schools was to help men to help themselves,—to find better opportunities for achieving success and happiness through employment at useful work, even if it involved discarding their "white collars." This is in keeping with the ideals of the organization in all of its activities.

The sort of contribution to the building industry that has been made is illustrated by one group of students which worked at tile setting in the new high school building at Scranton, Pa. Charles J. Bogert, a leading authority in the tile setting industry, says: "I never saw a better piece of work in all the years that I have been connected with the industry. Some of these corridors are from 30 to 50 feet long, and you can look along any joint and you will find it as true to line as if laid up with a chalk line." Another graduate tells how he is succeeding in business for himself. He ordered $1,400 worth of materials the first month, increased this to $3,000 the second month, and sees his way clear to a prosperous future. The students come from all parts of the world. Among the 27 enrolled last month, 17 different countries were represented.

The building trades school is training men sufficiently to go out, get a start, and "make good." Contractors are continually asking for graduates. The school is making a definite contribution toward the success and happiness of young adults mechanically inclined and capable of quickly mastering the practical fundamentals of bricklaying, plastering and tile setting. It is making a sizable contribution to a national construction program that urgently needs mechanics more than it needs anything else.

ARCHITECTURAL PHOTOGRAPHERS

THE FORUM is glad to make note of the fact that Tebbs & Knell have been awarded the contract for photographing the work of Graham, Anderson, Probst & White of Chicago, preparatory to the publication in book form of the work of this firm which succeeded Daniel H. Burnham & Co. Tebbs & Knell for many years, together with Paul J. Weber, Kenneth Clark and John Wallace Gillies, have been contributing photographs to THE FORUM'S pages.

A NEW LIGHTING PUBLICATION

A PUBLICATION of considerable value to architects in drawing up plans for ornamental exterior lighting is being distributed by the Westinghouse Electric and Manufacturing Company. The publication, which is known as "Number C 1674," is entitled, "Ornamental Brackets, Newels and Lanterns." As it has been issued primarily for use in architects' offices, the filing classification of the American Institute of Architects has been included on the cover of the book to facilitate its use.

A great number and variety of exterior lighting units, artistically designed for use in the illumination of entrances and facades of public buildings, the gateways of residences and private grounds, and the passageways of bridges and viaducts, are included. For every type of fixture included in the booklet, a clear photograph and a dimensional drawing are provided, together with a brief description. Views of actual installations of many of the units are also contained.

These paragraphs from the foreword to the publication indicate the purpose for which it is issued:

"Modern lighting science has made it possible for the architect or illuminating engineer to retain the decorative motifs of the early centuries in combination with the most efficient equipment for distributing light.

"Effectiveness in a lighting unit is a happy combination of lamp, glassware and light control. Efficiency need not be sacrificed to secure an artistic *luminaire;* in fact, the more ornate designs usually permit the inclusion of scientific equipment as readily as the simpler types of lighting fixtures."

LANDSCAPE ARCHITECTURE AT U. OF P.

THE scholastic year of 1924-1925 will see the inauguration at the University of Pennsylvania of a five-year course in landscape architecture which will be open to both men and women, leading to the degree of Bachelor of Landscape Architecture.

The new course is framed on the conception that landscape architecture is a fine art, and it will comprise a range of studies, both technical and cultural, deemed necessary to a thorough preparation for this art. The trustees have placed it under the direction of Robert Wheelwright, Landscape Architect and Member of the American Society of Landscape Architects. A graduate of Harvard University (A.B., 1906 and Master of Landscape Architecture, 1908), Professor Wheelwright has achieved success as a practitioner in this field, both in New York and Philadelphia, while as a member of the American Society of Landscape Architects he was one of the founders and for ten years an editor of its official organ, *Landscape Architecture.*

ASIDE from its dignity and presence, the flexibility of Telesco Partition makes it particularly adaptable for reception or waiting rooms.

No matter what your first requirements—no matter how they change, Telesco Partition can be changed with them. Standard units, extension top, screwed together construction, all make this possible.

Send for complete catalogue.

34-C

IMPROVED OFFICE PARTITION COMPANY

25 GRAND ST. ELMHURST, NEW YORK, N.Y.

The
ARCHITECTURAL
FORUM

VOLUME XLI JULY 1924 NUMBER 1

Style and Expression in Landscape Architecture

By CHARLES DOWNING LAY

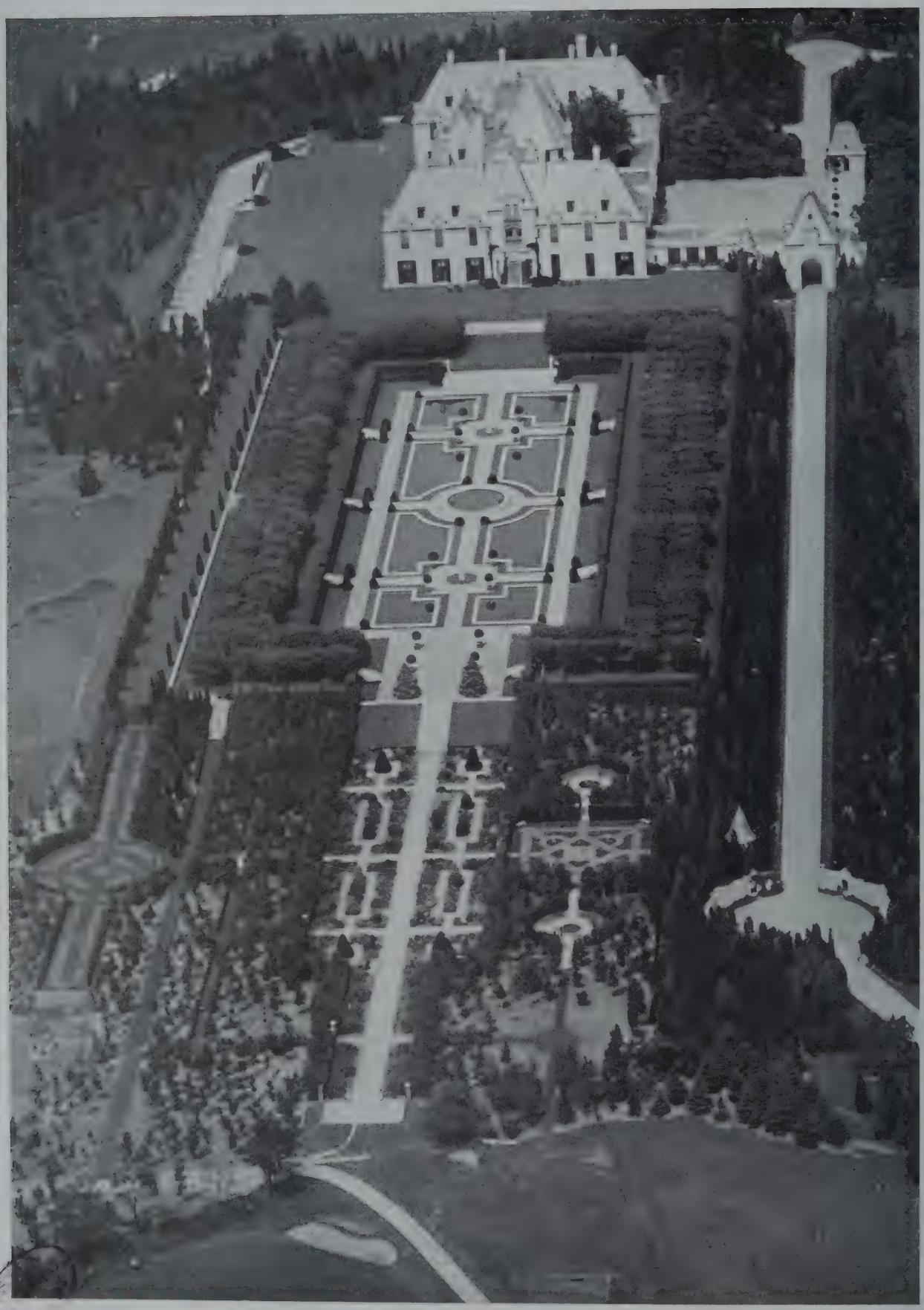
THE style of a landscape or of a garden is usually subject to two influences. It must, first of all, meet and give perfect expression to all the features of the site—that is of the geologic condition which has been created. It must be quite obviously the right thing for that place. This should be seen in the construction of all its features, in all the planting which has been put in to give an originally pleasing scene the greatest richness of detail. Second, the whole must harmonize in every particular with the tastes, the desires and the mode of life of the owner or of the public which is to use it. The success on these grounds of any work must be judged empirically, not rationalistically, for as our desires and habits change, the type of landscape or of garden which we consider appropriate may change also. The success of a new place or a new arrangement in meeting new conditions cannot be judged in advance by comparison with existing standards. It must be judged by trial after habits and customs have become established.

A common instance of this is to be found in certain aspects of the change from horses to motors. At first motors, being only horseless carriages, were put in the stables which were placed with regard to the conditions of a stable. Now we are quite certainly reaching the point of putting the motors close to the house or in an ell of the house, or, as the last step toward convenience, in the basement of the house itself. Driveways in parks and on country estates and forecourts on suburban places have been long in reaching the point of reasonable design for the use of motors, for we have been slow to think in terms of the new vehicle.

The difficulty of securing domestic help and our dissatisfaction with it when secured will have an inevitable influence on the size and character and the design of all our landscapes and gardens. This is not, I think, a condition to be regretted, for the result should be to turn us from the laborious practice of the fussy kinds of horticulture to a deeper thought of the artistic qualities of a garden and toward a kind of garden which depends for its success on permanent features rather than on the fleeting beauty of planting which soon perishes or outgrows its charm. It will, I think, be an influence for smaller size and higher quality in design and in execution. It is likely also to bring about a sharper line of separation between the well kept and formal parts of the place and the outside wilds, so that the one represents concentrated order and the other rampant nature, or at least nature intended to appear as if free from interference. If in this change we lose the suburban, park-like lawn dotted with specimen trees, the gain will be immense. Within the limits of suitability and use, which I have pointed out, there are limitless opportunities for the perfect expression of the designer's personality or of the owner's tastes. We need not fear that these conditions will seem hard or result in a fixed type. I believe they are, on the contrary, a stimulation to effort on the part of the designer and that they will produce in the public a critical taste which we have never known before.

It is the belief of many that professional help should not be sought by the owner who wishes to improve his place and make it fit more perfectly his own taste. People sometimes talk loosely about "expressing" themselves and fear the touch of other hands on work which they wish to be their own. But they forget that their knowledge of the technique is as insufficient as their strength to permit them to carry out the simplest ideas. If they employ men who are only craftsmen the work will inevitably express them and their possibly mediocre ideas, for the owner usually lacks the power to control or direct the workman. Grading foreman, bricklayer, stone mason, road builder and nurseryman, each will do quite honestly what he considers best, but it is often a best determined by habit and uninfluenced by wide experience with many methods.

The professional designer, with his knowledge of materials and of methods and his freedom from the restraints of local fashion, is much more able to help the owner express his own personality. He is likely enough more conscious of the personality and understands it better than does the owner himself. It is quite possible, and perhaps not undesirable, that two personalities should be expressed in the same work, chiefly, that of the owner in the broad aspects



Avigon Aerial Photos

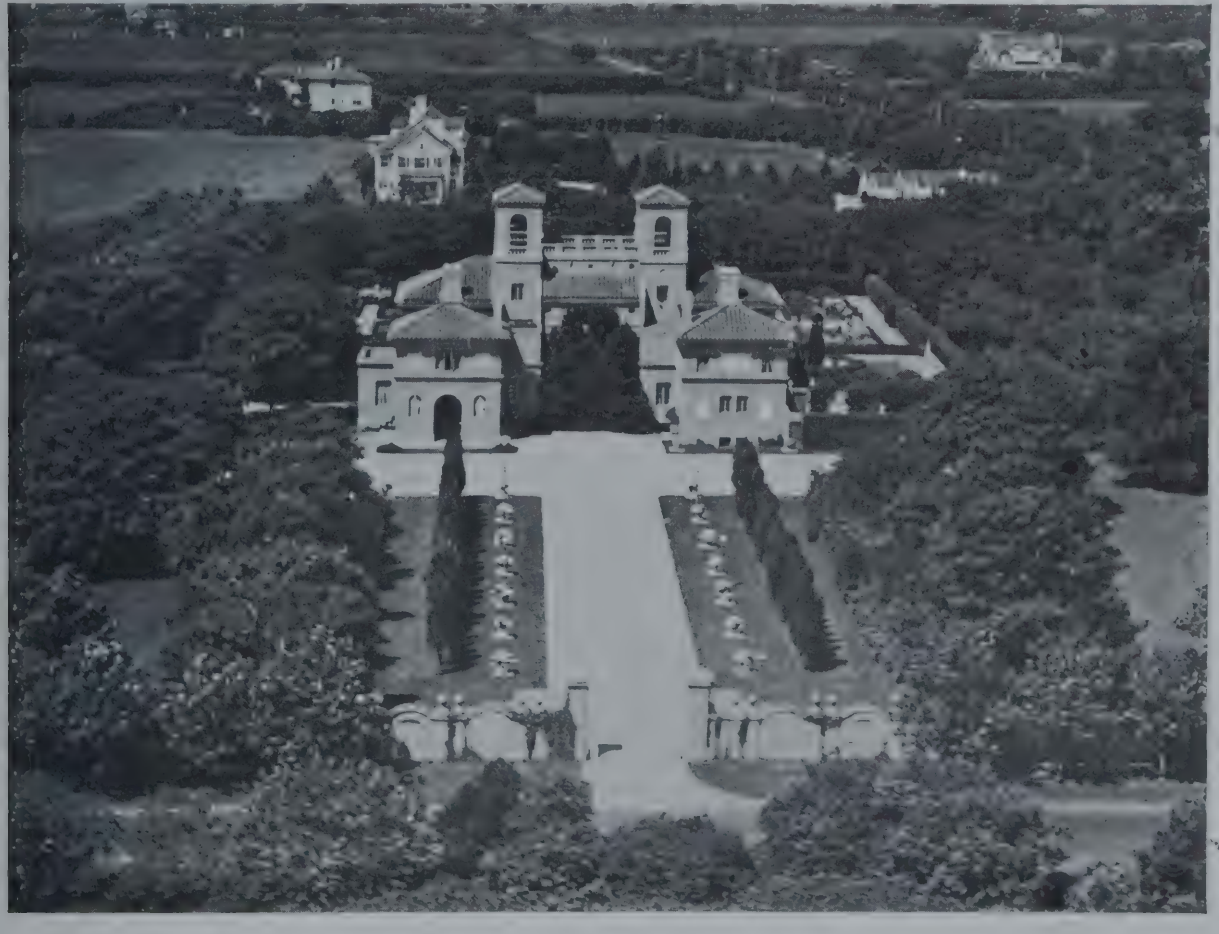
ESTATE OF OTTO KAHN, ESQ., COLD SPRING HARBOR, N. Y.
DELANO & ALDRICH, ARCHITECTS

of the work, since it is he who determines what shall be done and on what scale. The inclusion or the omission of this or that feature is determined by the owner, while the designer puts his personality to a certain degree into the details, in the technique of its execution. The designer must be responsible as well for the æsthetic qualities of the work and see that it fulfills the conditions of all works of art in having harmony, rhythm and balance. It cannot be thought a detriment that the designer should show by slight details the authorship of the work. This is shown inevitably in the work of every artist. There are tricks of handling, short cuts to the result, no matter what the medium, and these are recognizable by the knowing on sight. If these marks are slight, they add interest to the work. If, however, they become a fixed habit in design they may be, because of too frequent repetition, tiresome. The more proficient the designer the less likely it is that he will acquire a set habit or a tiresome style.

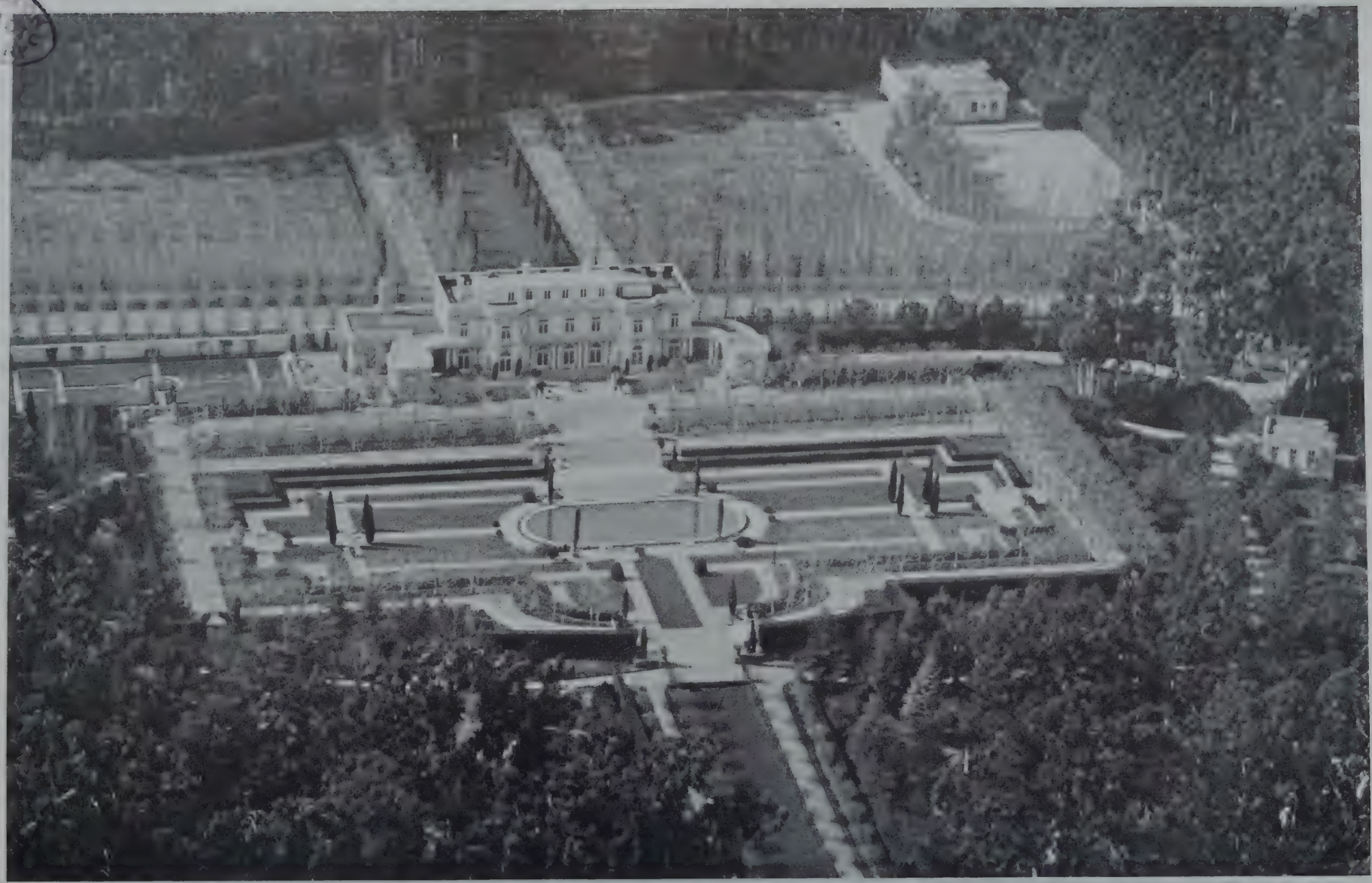
It is fair to ask what may be expressed in a garden or landscape that is worthy of expression. We can show in the garden that the owner and designer have lively reactions to the outside world; that they are, in other words, quick to see and to enjoy and have a mental and emotional equipment which makes it possible for them to feel deeply. To see another's garden may give us a keen perception of the richness or poverty of his personality, of his experiences and associations in life and of his spiritual qualities. It is evident to me that we are becoming more critical of design in gardens and landscapes and judge them more fairly and with more regard for their artistic qualities than ever before. We have passed in our appreciation of this art the stage which we were in 30 years ago in regard to architecture. Anyone who could direct carpenters or do a mechanical drawing was considered an architect, and if there were no one of that calling around, one was content to have a builder design a house.

As a means of studying one's own place, a plan drawn to scale on paper is of the greatest assistance, for it brings within the grasp at once all the features of the place and their relations to one another. Studying, first on paper, then on the ground and then on paper again, one is sure to reach an understanding of the problem and a conclusion which is likely to be right, though not the only possible conclusion. For the same reason it is the part of wisdom to make a plan of the whole place before anything is done on it. If one thing be done without consideration of the whole, it is likely not to fit or not to be right when the next thing is done.

The advantages which a scale plan gives in studying the relations of a place or the design of a garden



Estate of Morgan J. O'Brien, Esq., Southampton, N. Y.
Main Entrance and Approach to House

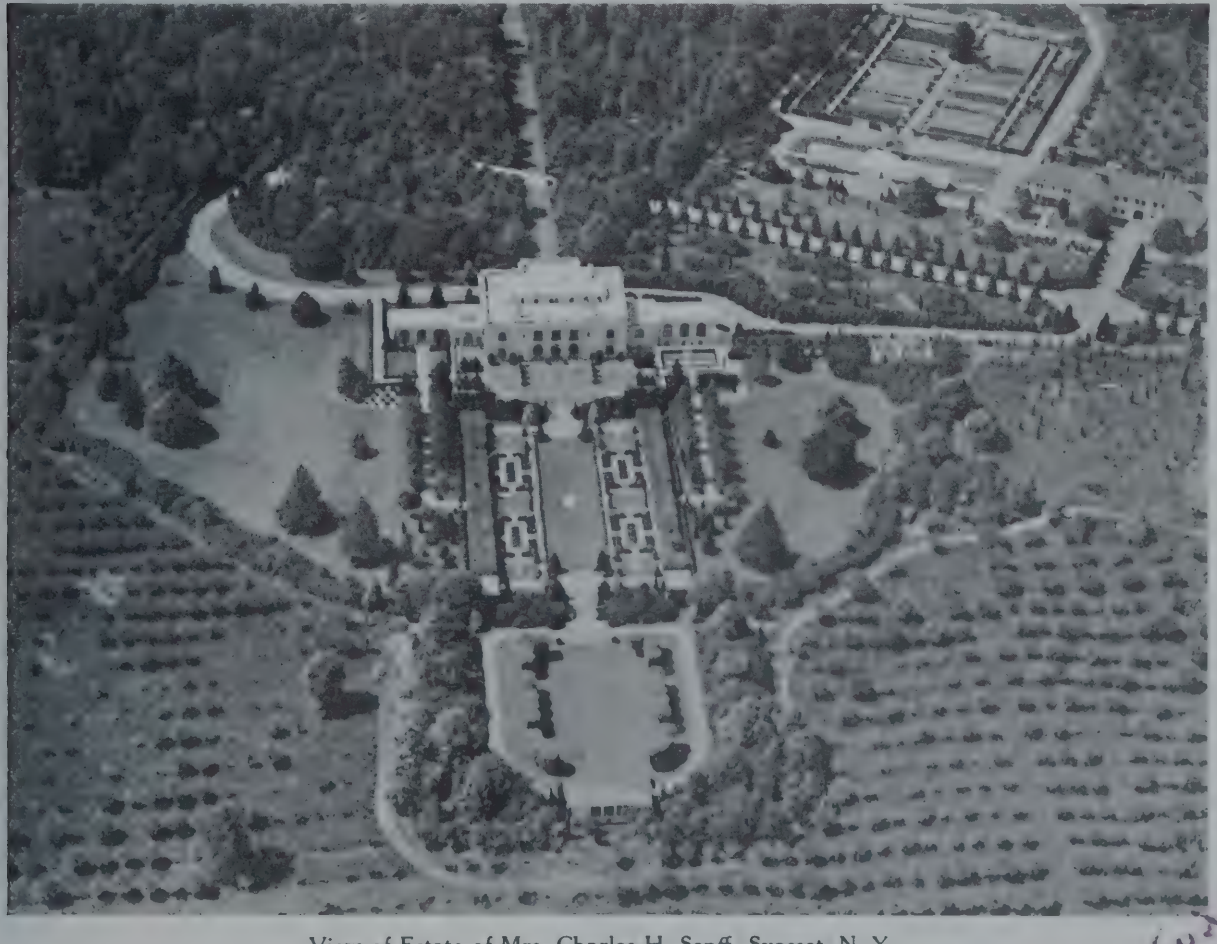


VIEW OF THE ESTATE OF GEORGE NEWHALL, ESQ., BURLINGAME, CALIFORNIA

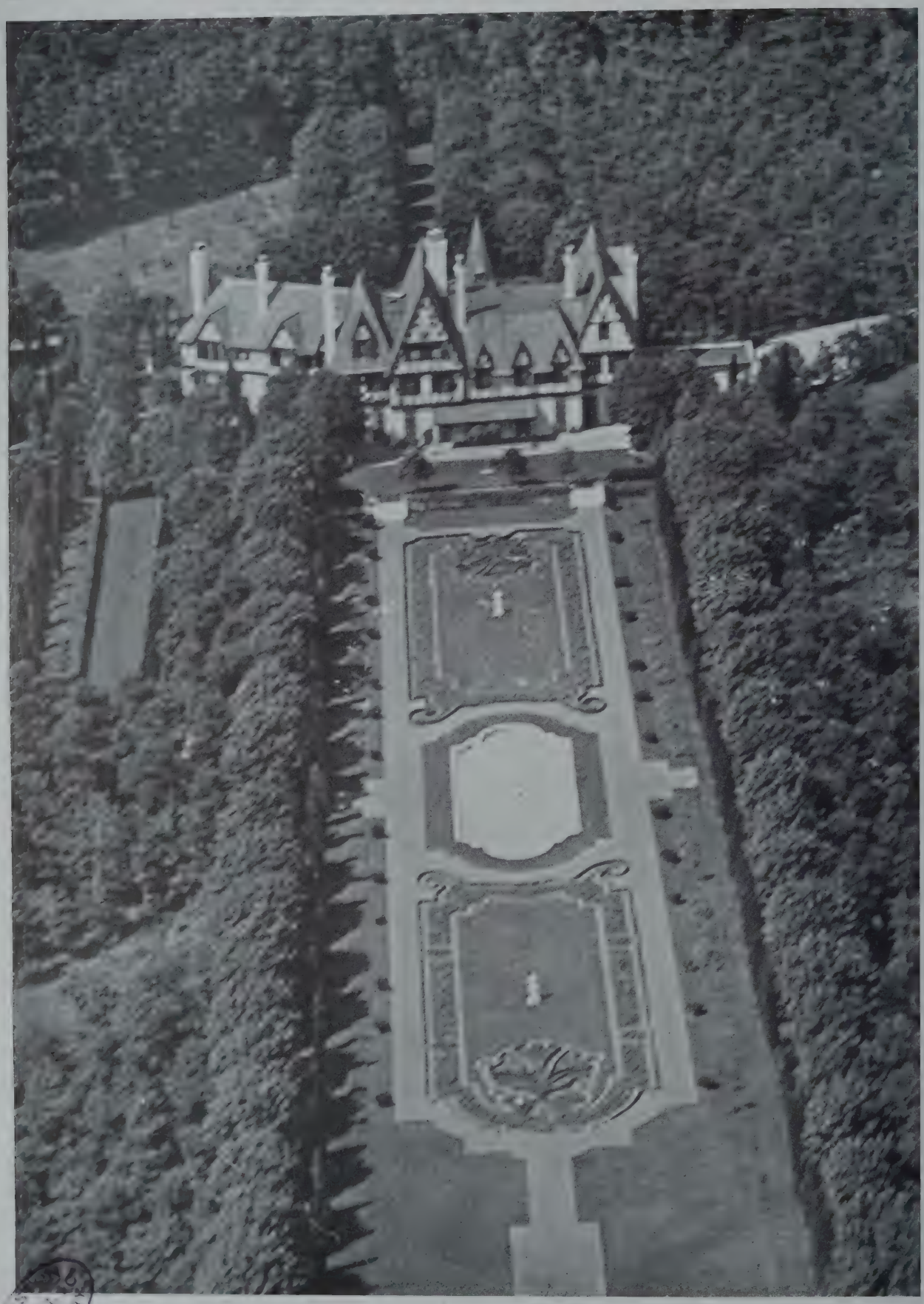
GARDEN FRONT OF HOUSE, ENDING IN A MALL OR ALLEE THROUGH WOODLAND

are great, but the difficulties at first are considerable, for a plan of a garden or a landscape represents three dimensions instead of the two dimensions which are sufficient in any plan or elevation of a house. It is puzzling to visualize, as one looks at the plan, the changing levels of reality, so that the beginner finds a complete realization of the whole remodeling of the surface hard to grasp. The contour lines of the plan, which convey the shape of the surface so quickly to the experienced eye, do not, it seems, give the same sure knowledge to the inexperienced. It has been suggested that models, since they represent three dimensions, would make it easy to explain a scheme, but they are expensive to make and they have the fault that they are objects and that one is likely to judge them as such rather than use them as a means for visualizing actuality. A model may be fascinating and wholly satisfactory, yet the place when built may be disappointing. A hill modeled to a correct scale may seem insignificant, yet in reality be unexpectedly large.

There is throughout the country a strong inclination to formalize all works of landscape architecture. For this the architects are in part responsible, but it is also the natural result of increasing culture and desire to live in an environment which is in every detail consistent and in harmony with life. Formalization, too, furthers one's wish to carry the influence of the spirit beyond the borders of the mind and into reality. As our people become more civilized they take less pleasure in the accidents of wild nature and long for order and a definite plan in all that they do. This was indeed their feeling, competently shown in the architecture of the early republic and in the planning of cities, but it was interfered with by romanticism which led them to worship the picturesque, the accidental and the unexpected in nature. Untouched nature thus came to have a kind of sanctity because man's influence could nowhere be felt,—as used to be said (or rather sung), "where every prospect pleases and only man is vile." A more sensible view prevails today, and one sees in Nature nothing higher than oneself; the wild landscape, having lost its mystical perfection, is interesting only as an environment for man. The next step in common sense thinking which one should soon take is to consider all man's works as much a part of his natural environment as the home of the beaver or the muskrat. This relieves one of the former necessity of looking on the city and the railroad as something artificial and unlovely, interfering with nature and to be excused as a fault which may be outgrown. In our country places the tendency to minimize the importance of natural accidents is clearly manifested. One feels no longer that the shrubbery must be a tangle and the lawn



View of Estate of Mrs. Charles H. Senff, Syosset, N. Y.
Hiss & Weekes, Architects



ESTATE OF MRS. W. K. VANDERBILT, 2ND, JERICHO, N. Y.
A STRIP CUT IN DEEP WOODS LAID OUT AS A SIMPLE FORMAL GARDEN

be an unrestricted space dotted with trees, planted, as someone recommended, by throwing a bushel of potatoes one by one in all directions and planting a tree where each is found. One is free now to plant in rows or in pairs, and one delights in a sharp line of demarcation between the formally laid out parts of the place, which repeat or accentuate the scheme of the house, and the more or less wild and unkempt spaces beyond. One gains by this formality in the midst of informality a pleasing contrast, and in the formal or ordered portions of the place one enjoys unthinkingly the design, the most charming evidence of human feeling and hence the highest expression of the common nature from which we spring.

Progress in the direction of a higher organization in the surroundings of our houses has been helped by a deeper understanding of what nature left alone may really be. The lawn, which used to be thought of as a charming natural feature, is seen to be highly artificial and an ostentatious display of wealth. It represents, moreover, only a temporary phase in the operations of agriculture and left alone must soon be ploughed up for some crop or it will become a forest. It would be too cruel to inquire why if a lawn can be mown a tree cannot be clipped without offense to the worshipers of natural beauty!

We can do as we please with the landscape, with the trees, or the grass, so long as we are guided by a desire to produce a work which is organized and designed to stimulate the beholder to feel an emotion of beauty. Our work often fails in this æsthetic stimulation, for a place which in other days might have seemed satisfactory since it pretended to offer nothing more than convenient access to the house, agreeable views from the windows, and lawns and trees, becomes when formally developed a challenge to criticism, and any feature which is not delightful is, because of its attempt to be so, offensive, and drives us to unreasoning and distracted dislike.

Formal work seems easy to the unthinking, for it must be, if successful, obviously right and at the same time it must be free from eccentricity. It appears then quite simple to do. Yet the great designs are not so many that their value can be lightly regarded. In the hands of the incompetent formal designs result in dullness, in meaningless repetition of inharmonious features, so that the scheme as a whole shows no invention, no activity of mind, no inspiration, and lacks the vitality which at once impresses us in a real design.

There is a type of design common in Europe which we might well try here. It is as if the house were put on the axis of a street or *allee,* with a view of the distance to be sure, but with no concern beyond the straight, unbroken sides. We are thus restricted to one view and the development of the

Estate of William D. Guthrie, Esq., Locust Valley, N. Y.
Showing Series of Formal Gardens and Allee Between House and Ocean

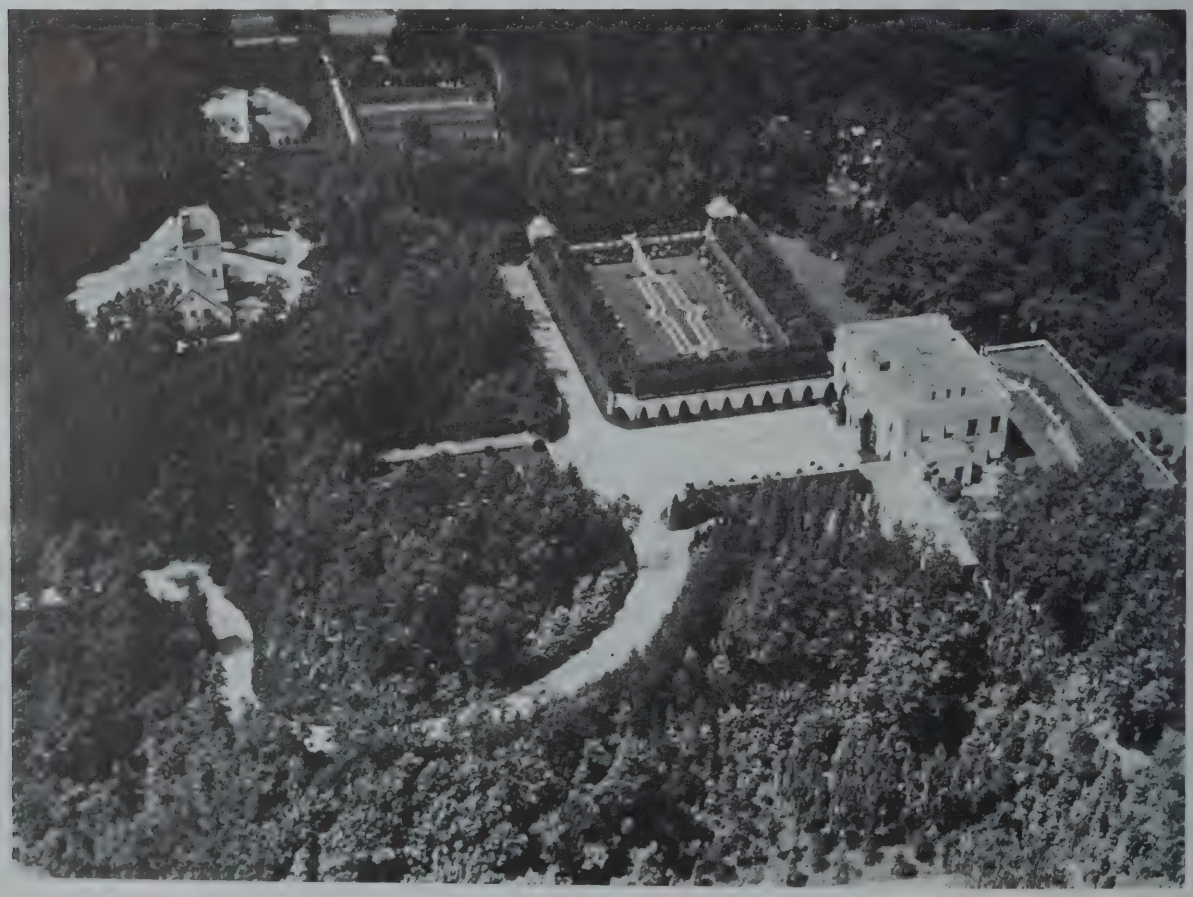
narrow space between the sides of the *allee*. Such a scheme gives plentiful opportunity for brilliant and moving design, can be embellished as one wishes, and avoids some of the pitfalls of our usual attempts to cover the whole landscape with our works and to see it all at once. A strip cut in the deep woods with the house at one end looking down a slope to distant blue beyond simplifies the problem and gives at once unity or harmony which few of our large country places now possess. It is not the highest type of design, but it offers many delights to those untrained in the subtler beauties of occult balance and rhythmic vitality. As a stage for the ordinary activities of social life the restricted plan has many advantages, while for the poet or the artist or the philosopher, the more complicated problems of the freer kind of design are more pleasing.

In the end it makes not so much difference, perhaps, whether we work in a style which is formal, that is symmetrical; or informal, that is occultly balanced; for it is the quality of the design, its vitality which we feel rather than see, that gives us the most lasting pleasure. Freed from its sensuous delights of soft airs bearing fragrant breaths from the flowers and the trees, and without the alluring magic of brilliant color, it is still, because of its arrangement of masses, its composition in space, capable of arousing in us the emotion of beauty the designer felt.

The garden must in short be judged, so far as such judgment is possible, by its effect on our deeper emotion rather than by its sensuous appeal. For, although the influence of the garden or the landscape on our senses is great and entirely proper, it should not be allowed to blind us to its fundamental quality, which is to be found in its design; and it is in this that the designer finds his justification. It is this that makes him worthy of his hire.

Editor's Note. The aëroplane photographs of several Long Island estates, which accompany this article, illustrate admirably the type of design Mr. Lay particularly recommends in a later paragraph,—a style of architectural landscape common in Europe, in which the house is definitely made a part of the complete plan by placing it on the axis of the garden and *allees* which are laterally enclosed by dense plantings of trees. "A strip cut in deep woods with the house at one end," looking down over a simply planned formal garden, well describes both Mrs. Vanderbilt's charming chateau at Jericho and Mr. Guthrie's extensive estate at Locust Valley. The French chateau of Mr. Kahn at Cold Spring Harbor overlooks a formal terraced garden, with elaborate topiary work, laid out in a balanced design. At Syosset, Mrs. Senff's villa, through its axial relation to the formal terraces, gardens and lawns, becomes an integral part of the whole architectural landscape design. In Judge O'Brien's Italian villa at Southampton the front entrance drive and court, as well as the formal gardens at one side, are indispensable parts of the whole design. The terraced gardens and long *allees* of Mr. Newhall's estate at Burlingame, California, give the needed vistas and formal setting required by the classic character of the architectural style in which the house is designed.

These illustrations were made by the "Aërial Aiglon Photos.," New York.



Estate of Bertram G. Work, Esq., Oyster Bay, N. Y.
Delano & Aldrich, Architects

The Fraternity Clubs Building, New York

MURGATROYD & OGDEN, ARCHITECTS

IT is not many years since the first Allerton House was built, establishing what has become one of the unique features of New York life. These great houses for men and for women, which fill an ever-increasing want, are becoming indispensable to the people for whom they are intended, and are solving one of the many sides of the general housing problem of today which is vitally important.

As the city has outgrown its boundaries and its accommodations, and as building costs and living expenses have doubled and trebled, concentration of every sort has followed by force of necessity. Apartment houses, both reasonable and costly, now rise from nine to 18 stories, where one room and bath or ten rooms and five baths may be obtained to suit the requirements and the resources of the tenant. Coöperative ownership of apartments as well as of office space is fast taking the place of landlord and tenant. The kitchenette apartments, the walk-up rooming houses and the moderate priced small room hotels are rapidly replacing the old fashioned boarding house, which for more than half a century was one of the institutions of the transient life of New York and its people.

View Looking South on Madison Avenue of the Fraternity Clubs Building

The club hotel is not only necessary in large cities, like New York and Chicago, where a very large one is now nearing completion, but also in smaller cities and communities as well. It is designed to accommodate under one roof all the comforts of home, with the conveniences and privileges of a club, containing lounges, writing and reading rooms, dining rooms, billiard and game rooms, gymnasium, squash and hand ball courts. This is particularly true of the Fraternity Clubs Building at Madison Avenue and 38th Street, New York, which contains all of the features mentioned and provides every luxury of a private club. It is the latest example of concentrative and coöperative housing in New York, and goes one step further in the development of community buildings. Instead of one vast public club, which other Allerton Houses were designed to be, here are 16 Greek letter fraternities and the Cornell Club housed under one roof. With the exception of the Cornell Club, which has its own dining and grill rooms and kitchen, all the fraternities use in common the two large dining rooms on the entrance floor, easily reached from all the upper floors.

Having touched lightly upon the unusual type of community service provided by the Fraternity Clubs Building, some description of the structure itself is in order. In general the plan is shaped like the letter "H," the main stairway, corridors, elevators and service stairs occupying the center of the building. In the sub-basement are located the boiler rooms, coal storage rooms and mechanical equipment. The basement contains the kitchens, store rooms, pantries, service dining room and quarters, together with a public portion, where one finds the oyster bar, the billiard room, the barber shop, the valet's room, and a club valet's room, where a non-resident has all the privileges of a resident. The entrance floor shows the usual arrangement of spacious foyer, which here also serves as a lounge. The necessity of having public parlors or living rooms is obviated in this special type of building by the fact that each fraternity club has its own club quarters. Two large general dining rooms with service pantry between, office space for the management of the building, mail room, telephone and telegraph room, two small private dining rooms, women's reception room, one long club room, service entrance and elevators, as well as the private entrance and elevator for the Cornell Club, make up the arrangement of the entrance floor. On the first and second floors are located most of the 16 fraternity club rooms. Those on the first floor are larger,

Pavilions and Towers Crown the Building

with high ceilings and spacious arched windows. Thus are provided club rooms of varying sizes to fit the requirements and membership of each fraternity. In addition to club rooms the second floor has a small gymnasium, three squash courts, lockers, lounges and showers. The bedroom floors have been planned with great care to eliminate all waste space and to provide as many rooms of varying sizes as possible, which are rented by members of the various fraternity clubs, or through "guest cards" by their friends.

The 16th floor is given up entirely to an open roof garden, a solarium, and loggias. The enclosed solarium on the south makes a delightful parlor for winter, while the deep open loggia on the north makes a cool and spacious retreat for the hot evenings of summer. Shallow arcades connect the solarium and summer loggia. By the center lobby on this floor these porches and loggias are accessible from the four main elevators of the building.

The design as a whole is consistently and logically worked out to serve the special purpose for which the building was erected, in the Renaissance style as developed in northern Italy. On the exterior the rusticated walls of the two lower floors are of warm, reddish brownstone, which harmonizes and blends well with the red brick used for the walls above. These walls have been broken up by bringing out piers between the windows of the center bays on each facade, and at all the corners of the various wings. As all the cornice lines and corbeled string courses have been kept very flat and narrow, these projections of the walls or flat piers greatly increase the vertical effect of the several facades. Protruding brick in diaper arrangement emphasizes still more these piers, making a pleasant contrast with the smooth brick of the intervening wall surfaces which hold the window openings. Above the 11th floor the design acquires unusual charm and picturesqueness through the delightful way in which the architects have piled up, in retreating tiers, octagonal corner towers with graceful lanterns, low pavilions, tall arcaded loggias, heavily corbeled open balconies and slender turrets, all roofed with deep-toned red

Lower Half of the Madison Avenue Facade

tile, the whole design crowned and dominated by a rectangular penthouse, splendidly proportioned and well disguised by a heavy cornice, tile roof and massive balanced chimnies. No towering, turreted castle of the Arabian Nights, no picturesque hilltop castle of Maxfield Parrish's fertile fancy could be more delightful than this well ordered massing of temples, towers and turrets, which crowns and distinguishes the Fraternity Clubs Building.

Among the many details which give distinction and expression to the architecture of this building is the triple entrance door on 38th Street, with open arcaded loggia above, which shows a quiet dignity and refined restraint, characteristic of early examples of the Florentine style. Wrought iron lanterns and window grilles lend interest to the rusticated facades of the two lower floors. On the sixth floor the center windows of the corner bays have been emphasized by arched openings and carved stone balconies to relieve the monotony of the rising tiers of windows and flat wall surfaces. These balconies, reminiscent of Florence, cast pleasant shadows on the red brick walls and give spots of interest on the two principal facades.

Interesting Skyline from Madison Avenue

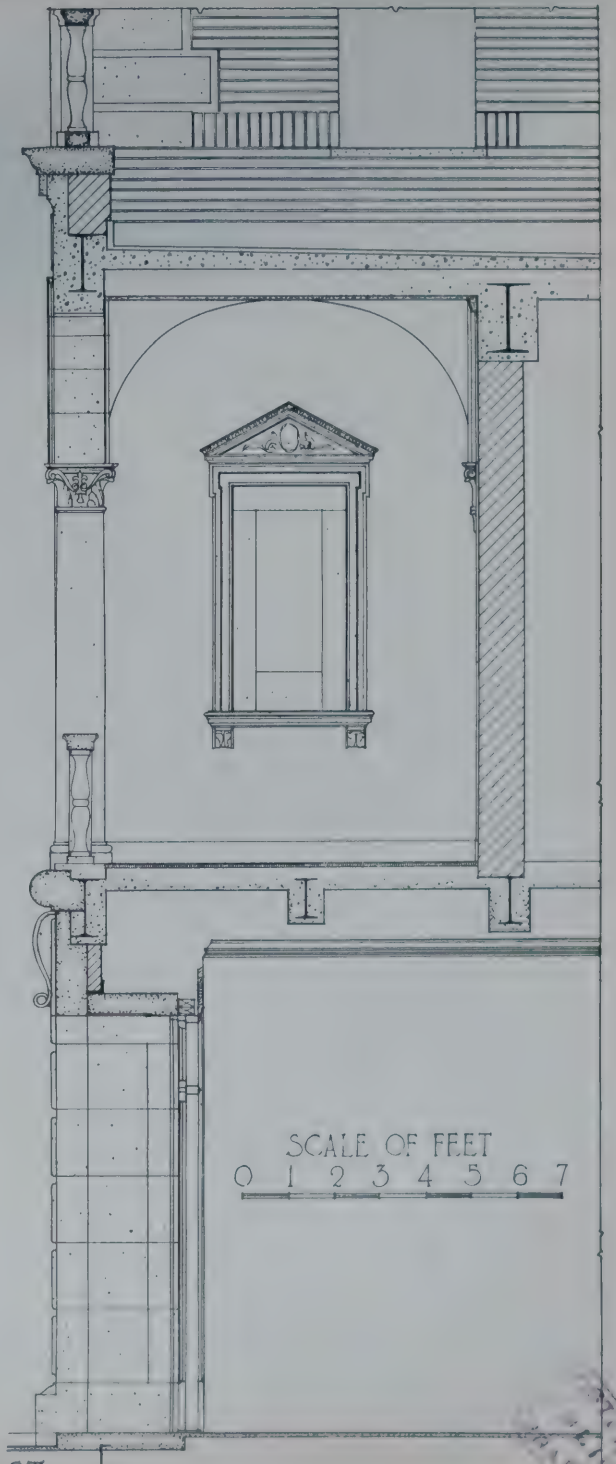
Entrance to Cornell Club on Madison Avenue

Terra cotta has been used in the loggias and arcades which top the center mass of the building, for the caps of the octagonal brick columns, and for the pierced lattice-patterned balustrades between them. In the north or roof garden a marble pebble cement has been effectively used for the floor pavement, while the vaulted ceiling has two-colored marble chips applied to the colored stucco. The arches of these arcades are outlined with raised brick, as are the circular panels occurring at the top of each of the small square corner turrets which terminate the arcades. The penthouse forms a finial to the entire composition, the walls of which show small arched windows, used singly, coupled or tripled on each of the four facades. Delicate colonnettes are used in the double and triple windows, between which a vigorous diaper pattern in raised brick adds textural interest to the walls of this well disguised penthouse.

A harmony of color characterizes the exterior of the Fraternity Clubs

BOSTON PUBLIC LIBRARY

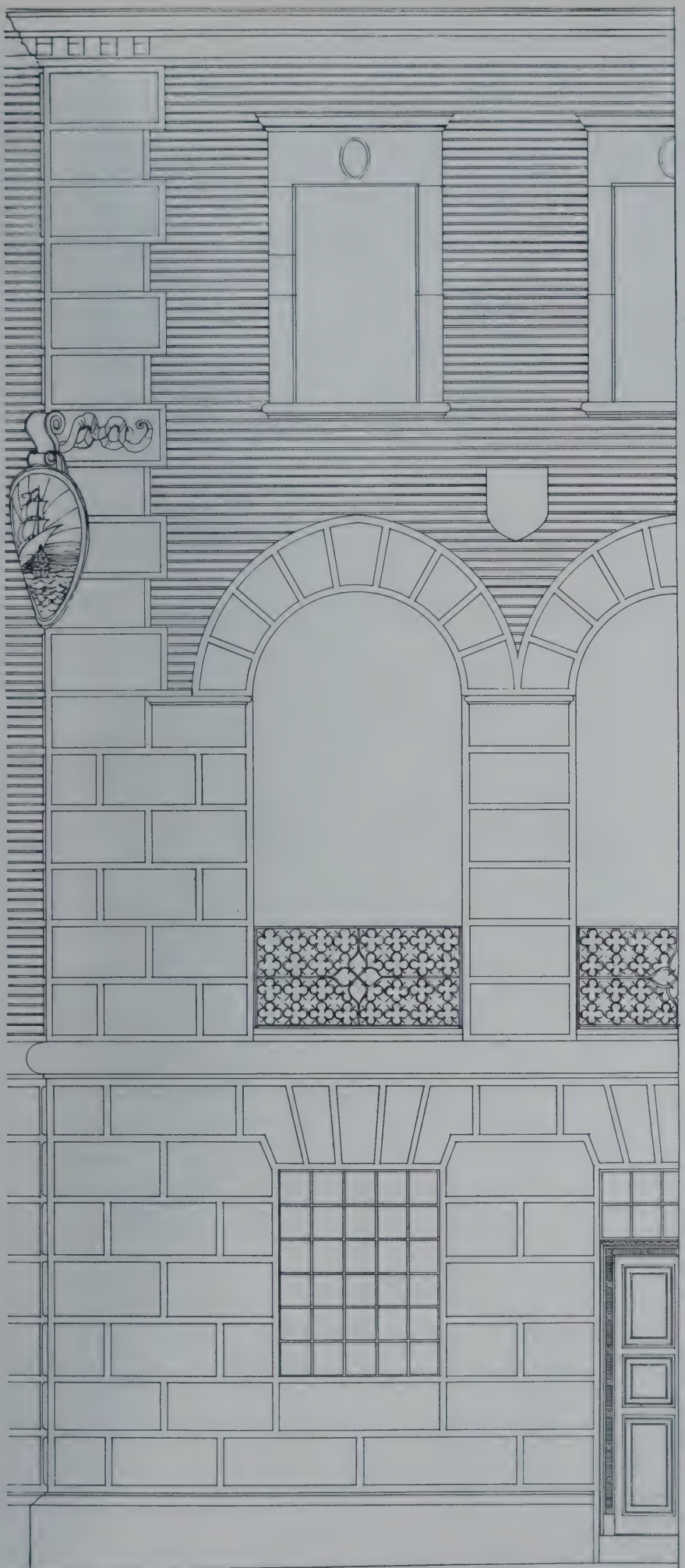
DETAIL OF MAIN ENTRANCE SHOWING ITALIAN LOGGIA ON SECOND FLOOR
THE FRATERNITY CLUBS BUILDING, NEW YORK
MURGATROYD & OGDEN, ARCHITECTS



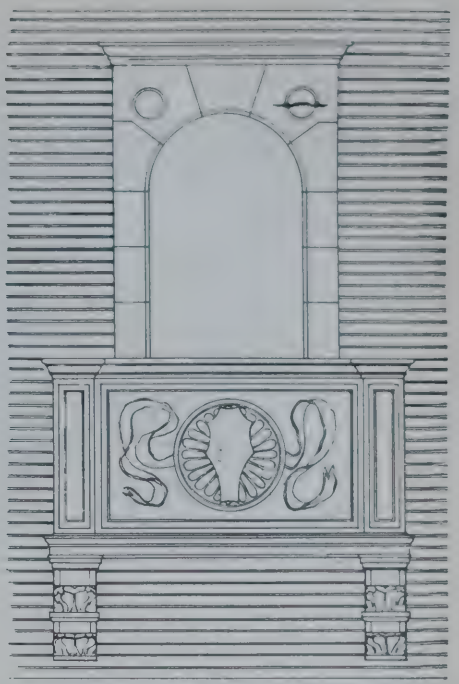
MAIN ENTRANCE AND LOGGIA ON 38 ST.

View From the West of the Arcade, Corner Towers and Penthouse Which Crown the Fraternity Clubs Building, Showing Interesting Texture of Wall Surface Produced by Random Projection of Bricks

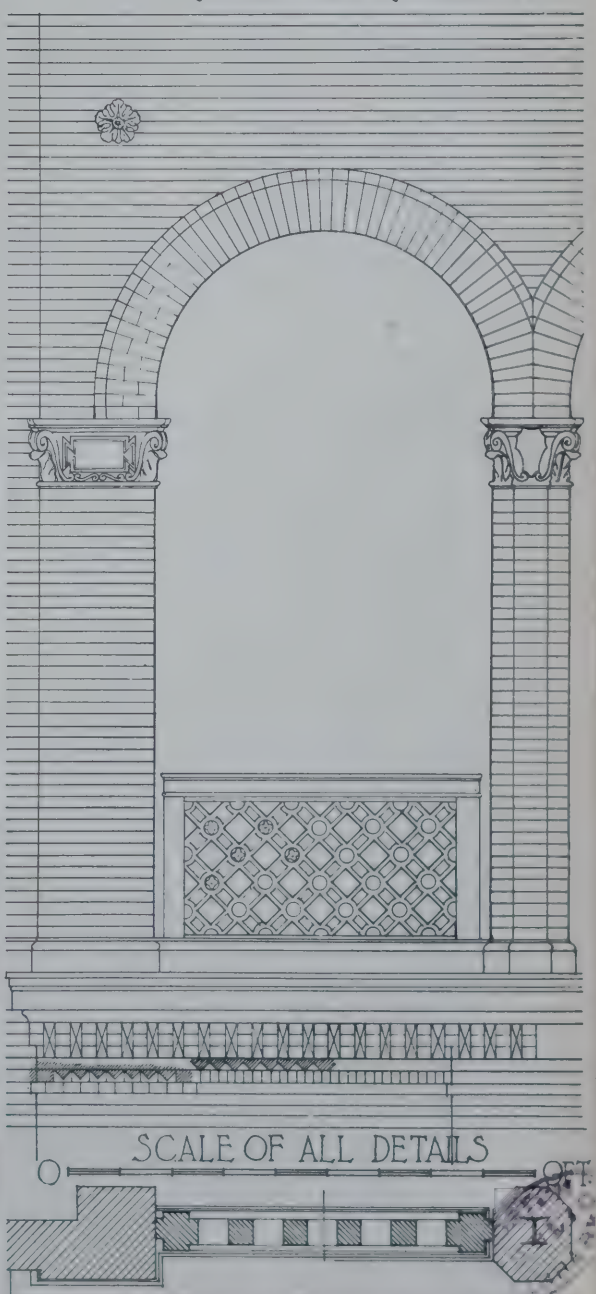
Building, from the warm reddish brownstone of the lower stories up through the tall walls of brownish red brick with trimmings in red terra cotta, to the red tile roofs of the crowning towers and pavilions. The interior shows a further consistent use of the Florentine Renaissance style, not only in the architectural details, but also in the furnishings and mural decorations. Through a spacious vestibule on 38th Street the vaulted foyer and the stairhall are entered, in which the walls are paneled in travertine with marble pilasters and base, the vaulting decorated with fraternity emblems in low relief and richly colored designs in Pompeian red and blue, the floors paved with red and brown tile and covered with large rugs in Italian designs and coloring, giving to this entrance lobby and lounge the key to the interior decorative treatment. A straight hall leads from the street door to a formal marble staircase, which has a wrought iron and gilt bronze handrail. At right angles to this entrance hall is the lobby or lounge, with the manager's office at the east end and the entrance to the private dining and reception rooms at the west. In a small arcade at the left of the entrance is a haberdashery shop, balanced by a cigar and candy counter at the right. The reception and private dining rooms are paneled and painted, one in a dull antique green, and the other in old ivory. Doors, trim and furniture are in American



DETAIL FROM MADISON AVENUE FACADE



DET FROM 5TH FLOOR BALCONY



DET. FROM ROOF GARDEN LOGGIA

Arcade Shop in the Entrance Lobby

Low Vaulted Oyster Bar in Basement

walnut of a rich brown tone. Dark tile floor and sub-bases give a rich contrast in these rooms. The larger reception room has wall and overdoor panels decorated with borders and flower garlands in colors, suggestive of French inspiration. The furniture is upholstered in tapestry and velvet in dark tones of blue, brown and green. The large private dining room at the corner has wainscot and woodwork in antique ivory; wall panels are filled with English chintz in blue, ivory and mulberry.

Two large main dining rooms complete the principal rooms on the entrance floor. That on Madison Avenue is particularly rich in effect, as the walls have high paneled wainscoting in dark walnut, against which seats upholstered in black leather have been built. The ceiling is elaborately decorated in color after the Italian manner, the walnut beams showing conventional designs in red, yellow and green on their soffits. Ornamental consoles support the beams, between which pattern in color relieves the panels of the ceiling. The high leaded glass windows are hung with curtains of heavy linen, old English in design, showing blue and brown on a buff ground. Cloisonne terrazzo paneled in three colors is used for the floors. Perhaps the most striking feature of this room is the furniture. The low arm chairs are painted Pompeian red with black leather seats, and the tables are of walnut with black painted tops. The dining room at the southeast corner of the entrance floor is lighter in color treatment. The rough plaster walls, which are painted a deep buff, have a chair-rail decorated with running patterns in orange and black. The ceiling consoles and beams are richly finished in antique gilt, with designs in color on the soffits of the beams, and the plaster panels of the ceiling are painted a rich Italian blue. A massive fireplace with decorated plaster hood is the chief architectural feature of this room. Flower brackets and ventilation grilles finished in antique gilt and color make spots of interesting decoration on the walls. The cloisonne terrazzo used in alternating black and buff squares makes the floor of this room as rich and deep in tone as the ceiling. The chairs and tables are made of dark brown walnut.

The stairway of the entrance hall leads up to a formal corridor with a lofty, heavily paneled ceiling supported by sturdy fluted columns and pilasters in a well studied adaptation of the Greek style. The walls are painted rich green above a buff wainscot. Greek patterns in color ornament the capitals of the columns, the wainscot rail and ceiling line. Columns, pilasters and ceiling panels are painted light yellow, contrasting pleasantly with the green walls and the deep toned rugs which cover the cloisonne terrazzo floor. Stiff arm chairs in the Italian style and green bronze electric torches further emphasize the Greek treatment of this hall, upon which open eight of the Greek letter fraternity club rooms.

All of these club rooms are furnished and decorated in the Italian style, some more elaborately than others, as on the second floor where the high beamed ceilings are painted to imitate walnut and decorated in color. Warm rich colors of buff, gray and yellow are used for the rough plaster walls in the various club rooms. The low beamed ceilings of the various rooms on the third floor are all painted in light tones to increase the effect of height. Cement of a rich, warm brown, marked off in squares, is used for the floors. The furnishings of all the club rooms show a successful combination of comfortable, modern, upholstered arm chairs and sofas with chairs of English and Italian styles, together with massive walnut tables for lamps and magazines, floor lamps, small chairs and sofa tables and walnut bookcases with shelves and cupboards. Heavy rugs in large Italian patterns, showing blue, red and buff, cover the floors.

The enclosed loggia on the 16th floor, which is called the solarium, has plaster walls and vaulted ceiling, with the arch openings, windows and cornice line marked by red brick trim. Wicker and bamboo chairs and tables, iron flower stands, floor lamps and wrought iron chandeliers, together with the striped material of the window draperies, give a comfortable and congenial atmosphere to this high sun parlor, serviceable both summer and winter.

BUSINESS & FINANCE

C. Stanley Taylor, *Editor*

The Architect and the Law

By LESLIE CHILDS

Change in Personnel of Firm of Architects as Rendering Firm's Contracts Unenforceable

THE question of the legal effect of a change in the personnel of a firm of architects on the firm's contracts is one of considerable importance to architects in general. This point was passed upon in an interesting and instructive manner in the recent Kansas case of Smith *et al.*, vs. Board of Education of City of Liberty, 222 Pac. 101, and in view of its facts and holding it becomes a decision well worth a brief review.

In this case, Smith, Beattie & Company, a firm of architects composed of two members, T. C. Smith and R. O. Beattie, entered into a contract with the Board of Education of the City of Liberty whereby they were to prepare plans and superintend the erection of a high school building. The building as contemplated was to cost $175,000, and by the terms of the contract Smith, Beattie & Company were to receive a sum equal to 4 per cent of the cost of the work for their services.

After entering into this contract some time elapsed before the necessary sale of bonds for the building could be arranged, and in the meantime the firm of Smith, Beattie & Company was dissolved. By this change Beattie retired and Smith succeeded to all the rights and interests of the firm. Following this Smith took in a new partner, Harold T. English, and the firm took the name of Smith & English.

Under these circumstances the Board of Education declined to have any dealings with Smith & English as architects, and employed another firm to serve it. Thereafter Smith & English brought action against the Board of Education on the contract, which raised the question of whether or not Smith & English as successors to Smith, Beattie & Company were entitled to enforce the contracts entered into by the latter. Upon the trial of the cause a judgment was rendered in favor of the Board of Education. From this judgment an appeal was prosecuted to the Supreme Court of Kansas, where in passing upon the question in issue it was, among other things, said: "The propriety of the judgment, of the trial court, depends chiefly on whether the contract was for the personal services of the partners composing the firm of Smith, Beattie & Company. The business of an architect has the dignity of a learned profession. A competent architect is a person of peculiar skill and taste. He must be a man of culture, of disciplined mind, artistic eye, and trained hand; he must be able to visualize the possibilities of beauty and harmony in proportionate arrangement and understand construction in brick, stone, cement and steel; and he must have the art and deftness to set down his ideas with such precision in specifications and drawings that contractors and workmen can readily follow them with fidelity. * * * All these qualifications of a personal nature are involved in any prudent contract for the service of an architect. And so it seems that when the school board employed Smith and Beattie they contracted for the special knowledge, skill, and taste, the professional pride of achievement, the wisdom of the counsel, and the personal probity of both Smith and Beattie. * * * It must therefore be held that the defendant, the Board of Education, was not liable to plaintiffs, Smith & English, for the amount specified in the contract between Smith, Beattie & Company and the defendant. * * *"

In conclusion, the Supreme Court, after passing upon other matters not material to the subject of this article, concluded by affirming the judgment rendered in the lower court in favor of the Board of Education, holding, as outlined in the opinion, that owing to the personal nature of a contract for an architect's services the succeeding firm of Smith & English was not entitled to enforce the contract entered into by its predecessor, Smith, Beattie & Company, with the Board of Education; in other words, holding the contract to be non-assignable without the consent of the Board of Education.

This Kansas decision is obviously one of force and value on the point decided, and its holding is unquestionably in accord with the weight of authority. For, generally speaking, all contracts of this character, which involves special skill, talent, sagacity or personal confidence, are non-assignable without the consent of the other party thereto.

In the light of the facts and holding of the case reviewed, a change in the personnel of a firm of architects might have a far-reaching effect upon the contracts of such firm. In fact, in the absence of some provision in such contracts making them assignable, a change in the personnel of the firm would, in accordance with the rule of the Kansas court, render them unenforceable at the instance of the succeeding firm of architects. Truly this Kansas decision covers a point of great importance, and its

holding is well worth the having in mind by any firm of architects when a change in its personnel is contemplated.

Architect's Right to Mechanic's Lien Upon Premises for Drawing Plans and Specifications

The right of an architect to a mechanic's lien for services in drawing the plans and specifications of a proposed building has been passed upon in several instances. The majority of the cases dealing with the subject, however, have involved not only the drawing of the plans and specifications but the work of supervision as well, and while the decisions in these latter cases are not entirely in accord, the weight of authority appears to hold that the architect is entitled to a mechanic's lien.

But in cases where the architect has sought a mechanic's lien for services in drawing plans alone, where he exercised no supervision afterwards, or where the building planned was abandoned for some reason, there appears to be a sharp difference of opinion. New York seemingly holds that for drawing plans only, the architect is not entitled to a mechanic's lien. Minnesota has declared, in Lamoreaux vs. Andersch, 128 Minn. 261, 150 N. W. 908, L. R. A. 1915D, 204, that the architect may have a mechanic's lien for work in drawing the plans and specifications only, and this regardless of whether the work of construction was ever even commenced.

The Minnesota Supreme Court in reaching this ruling has given the mechanic's lien statute of that state a very liberal construction, and because of this, and the conclusion reached, the case is one of considerable importance to architects in general.

The facts in the case were also quite interesting. Lowell A. Lamoreaux *et al,* were architects. They entered into a contract with Louis and Julius Andersch and Charles Andersch for the making of plans, with details and specifications, for a building to be erected on two lots in Minneapolis owned by the Anderschs. Under the terms of the contract the architects were to superintend the erection of the building. The compensation for all the services contemplated was to be, according to the agreement, 4 per cent of the cost of the building. The architects prepared the plans and specifications, and submitted them for bids to contractors. After the bids were received the architects prepared details, and delivered the bids received along with the plans and specifications to the Anderschs. The latter retained the plans and specifications but took no action upon the bids submitted and thereafter abandoned the project of constructing the building altogether. The only work that was done toward the starting of construction consisted in removing an old barn that was on the proposed site. Thereafter the architects filed a mechanic's lien upon the land upon which the building was to have been erected. The defendants, the Anderschs, contested the right of the architects to file such a lien, contending among other things, that such a lien could not be filed in the absence of some improvement on the ground for the building.

The trial in the lower court resulted in a judgment in favor of the plaintiffs, the architects. The defendants, the Anderschs, prosecuted an appeal to the supreme court, and in passing upon the record, it was said among other things:

"Architects are entitled to liens for services in preparing plans and superintending construction where there is an actual improvement to which their work contributes. * * * It has been held that an architect's services in preparing plans only are not lienable, but we confess our inability to see why plans and specifications do not as much contribute to the construction of a building as does the supervision by the architect, and well considered cases so hold. * * * We think the plaintiffs, the architects, would have been entitled to a lien if their plans had been used in the construction of a building on the premises. Is this right to a lien lost when the owner, through no fault of the architect, does not use the plans or make the contemplated improvement? Liberal construction of the lien statute is the settled policy in this state, but the right to a lien in any case is still wholly dependent upon the language of the statute. * * * The answer to the question, therefore, depends upon the words of the statute, liberally construed to further the object of its enactment. Gen. Stat. 1913, Section 7020, * * * provides in substance that 'whoever contributes to the improvement of real estate by performing labor, or furnishing skill for the erection of a building thereon, shall have a lien upon such improvement, and upon the land upon which it is situated, for the price or value of such contribution.' "

The court next entered into a critical review of other sections of the Minnesota lien statute, and a discussion of the meaning to be placed on them, as well as upon the part already quoted. Then turning to the case under consideration it continued: "It must be conceded that the lien statute, if construed literally, does not expressly give a lien when no improvement is begun on the ground. Can we, by liberality of construction, nevertheless say that a lien may attach under such circumstances?"

The court then reviewed the Minnesota authorities bearing on the mechanic's lien statute in a thorough manner. Particular stress was laid on the fact that in some of these cases it had been held that a material man was entitled to a mechanic's lien, for material furnished the contractor, even though the material had never been delivered on the premises, this where the material had been delivered to the contractor in good faith, and under the belief that it was to go into the construction of the building. Then addressing itself to the case in hand, and reasoning from previous constructions placed on the lien law in the cases reviewed, the court continued: "We place our decision on the language of the lien statute of this state, as it has been construed in the cases referred to, and hold that there may be a lien

without an actual 'improvement,' and that we can fairly say that plaintiffs, the architects, 'constructively' contributed to an improvement of defendants' land in this case. * * * We, therefore, hold that plaintiffs had a right of lien on the land of defendants. * * *"

As said in the beginning, the decisions relative to when an architect is entitled to a mechanic's lien are not in accord. One reason for this conflict no doubt lies in the fact that the decisions have been based on lien statutes of different states, in the wording of which there is a lack of uniformity, and, considering this condition, a lack of harmony in the decisions construing them is not surprising.

The weight of authority holds that the architect is entitled to a lien where there is an improvement made and he both prepares the plans and supervises the construction. But, as has been seen, this Minnesota case goes much farther than this in holding that the architect for preparing the plans may have a lien upon the ground, notwithstanding there was no improvement on the land.

Substantial Performance of Contract as Excuse for Failure to Obtain Certificate of Architect

The question of whether a substantial performance of a building contract will excuse a failure to obtain a certificate from the architect, has been before the courts upon many occasions. The authorities are not entirely in accord on the point, but the great weight of opinion holds that such performance will not, in itself, excuse the nonproduction of a certificate; and that, to have this effect, it must be reinforced by proof that the certificate was wrongfully withheld.

An interesting case illustrating the application of the general rule was that of Bush vs. Jones, 144 Fed. 942, 6 L. R. A. (N. S.) 774. While this case is not the latest on the subject, it is selected because of the facts involved and the lucid language of the court. The facts in the case, insofar as material to this discussion, are thus:

A contract was entered into for the construction of a building. The contract provided, among other things, that the work should be paid for "only upon the certificate of the architect," and it seems that after the contractors claimed the work was completed the architect refused to give the certificate, on the grounds that the work was done in a defective manner. A dispute resulted which culminated in the contractors filing suit for their final payment, amounting as they claimed to $3,065, and a bill of some $40 extra. The case was tried before a jury, and considerable evidence relative to the quality of the work was introduced by both sides, the contractors contending that they had substantially performed the contract, and that upon proof of this they were entitled to recover without the production of the architect's certificate. The other side contended that the work was improperly done, and further that the contractors could not recover because they had failed to obtain the architect's certificate of satisfactory completion of the work.

The trial court left the question of whether or not there had been a substantial performance of the contract to the jury, but reserved the question relative to the importance to be attached to the architect's certificate, thus permitting the jury to return a verdict in favor of the contractors for $2,500, without the production of a certificate, or in any way considering what would be sufficient to excuse it. From the judgment so rendered the property owners prosecuted an appeal to the Circuit Court of Appeals. The latter court in passing upon the record, and in particular on the action of the trial court in excusing the production of the architect's certificate, as a matter of law, among other things said: "The law upon the subject of architects' certificates is well settled. It is perfectly legitimate to provide in a building or working contract that payment of the several installments of the contract price shall be made only upon certificates or estimates by the architect or engineer in charge as to the extent and value of the work done and materials furnished, and that final payment shall not be demandable without a certificate of completion. These are familiar provisions, universally recognized, and will be enforced. * * * Equally well recognized, however, is it that the production of such a certificate as a condition precedent to a recovery is not necessary where it is capriciously or arbitrarily withheld. But where this is alleged it is incumbent on the contractor, in order to bring himself within the exception, if he does not produce a certificate, to show why he cannot; and until he successfully does so he has not made out a case. * * *"

The court next reviewed a great number of authorities in which this rule had been adhered to, and referred to others in which the rule appeared to have been relaxed. Then, addressing itself to the case under consideration, continued:

"The conclusion to which this discussion leads is clear. Completion to the satisfaction and according to the trained professional judgment of the architect, who drew the plans and specifications, and is able to speak from a direct supervision over and inspection of the work as it progresses, and completion according to the opinion of the jury, under the imperfect conditions of a trial and the inability to produce things as they actually are, are two different and distinct propositions; and the owner, who has stipulated for the one, is not to be put off with the other, where everything is honestly and fairly done. Whether this is true, or whether the architect, in withholding his approval acts capriciously or fraudulently, where there is evidence to sustain this charge, has necessarily to be submitted to the jury, and proof of a substantial compliance with the contract entered into this as an essential step. But to hold that, upon such proof, without more, the necessity for the production of a certificate is dispensed with, or is to be regarded as unreasonably

withheld, and that, not as a fact, with others, for the consideration of the jury, but as a matter of law for the court, not only loses sight of the distinction which we have referred to, but makes the provision with regard to the architect's certificate useless and meaningless, for it puts a contract where it appears on a level with one where it does not; the contractor in the former being permitted to recover upon showing that he has substantially complied with it, and in the latter being required to prove no less. The jury in the present instance should, therefore, have been instructed that the production of a certificate was essential to a recovery, and that the want of it could not be dispensed with, unless it was established to their satisfaction that it had been unreasonably withheld. * * *"

The court thereupon reversed the judgment rendered in the lower court in favor of the contractors for the error of the trial court in permitting the jury to pass upon the case without consideration of whether or not the certificate of the architect had been rightfully withheld.

As already said, this case is in accord with the great weight of authority on the question, and enunciation is made in an admirable manner of the general rule, this rule, broadly speaking, holding, that in contracts requiring the production of an architect's certificate before payment, the contractor cannot compel payment in the absence of the certificate by merely showing a substantial performance of the contract.

Liability of Architect for Damage Caused by Defects in Plans and Specifications

Generally speaking, an architect is required to exercise reasonable skill, taste, diligence and care in the preparation of plans and specifications, and if he fails to do this either through incompetency, lack of care or negligence, he may render himself liable in damages for any resulting loss. Of course each case of this kind must necessarily be decided in the light of all its facts and circumstances, which precludes the statement of a hard and fast rule that would apply in all situations. However, as an illustration of what may constitute a cause of action against an architect in a case of this kind, Bayshore Development Company vs. Bonfoey *et al.*, a Florida decision reported in 78 So. 889, is well worth a brief review on account of its bearing upon many other similar cases.

In this case the Bayshore Development Company employed the defendants, who were architects, to prepare plans and specifications for the erection of two residence buildings. The contract also provided that the defendants should supervise the construction of the buildings contemplated. Pursuant to this contract the architects took charge and the buildings were completed, but the Bayshore Development Company was dissatisfied with the way the work was done. The company contended that the architects had not only failed in the matter of proper supervision of the work, but that the plans and specifications had been defectively drawn, which resulted in such grave defects in the buildings as to render them uninhabitable.

A dispute followed which culminated in the action by the Bayshore Development Company against the architects for damages. Upon the trial of the case the court directed a verdict in favor of the architects. From judgment on this, the Bayshore Development Company prosecuted an appeal to the Florida Supreme Court where, in stating the general rule, relative to the duties and responsibilities of an architect, the court quoted from Coombs vs. Beede, 89 Me. 187, in part: "The responsibility resting on an architect is essentially the same as that which rests upon the lawyer to his client, or upon the physician to his patient. * * * The undertaking of an architect implies that he possesses skill and ability, including taste sufficient to enable him to perform the required services at least ordinarily and reasonably well, and that he will exercise and apply in the given case his skill and ability, his judgment and taste, reasonably and without neglect. But the undertaking does not imply or warrant a satisfactory result. It will be enough that any failure shall not be by the fault of the architect."

Following the foregoing statement of the general rule, the court directed its attention to the question of whether or not the pleadings and evidence in the instant case justified the submission of the controversy to the jury. In this connection it was, among other things, said: "The first count particularizes wherein the defendants, the architects, failed to use ordinary skill and care in the preparation of the plans and specifications. It is alleged that they were faulty in design, defective, insufficient, and unsuitable for the purposes for which they were intended; that the stucco work was defective and faulty on account of materials called for in its composition and the manner of construction. * * * We have examined the evidence in the case, and find that, although there is no proof as to the defective composition of the 'stucco,' there was evidence sufficient to go to the jury as to whether the method provided by the specifications for applying it to the buildings was such as to show the proper care and skill which should have been exercised by the architect. The evidence upon this subject was conflicting, it is true, but it was in the province of the jury, and not in that of the court, to determine the facts. * * *"

In conclusion the Florida Supreme Court reversed the judgment rendered by the lower court in favor of the architects, holding, as outlined in the opinion, that whether or not the alleged faulty construction was caused by defective plans and specifications was on the evidence and pleadings a jury question, and that the trial court erred in directing a verdict for the architects.

The Federal Building, Honolulu

YORK & SAWYER, ARCHITECTS

As a result of a competition held in 1909, the designing of the Federal Building at Honolulu, containing the Post Office, Customs and Court Houses, offices of the Internal Revenue Department and quarters of the Weather Bureau and various Government officials, was awarded by the Treasury Department to York & Sawyer.

Mr. Ayres of that firm went to Honolulu in 1910, spending a month there to study the problem. He had considerable difficulty in convincing the local authorities and the Chamber of Commerce that it was not the architects' fault that the Treasury Department had used its standard competition program which specified a heating plant, and that it hadn't been done with the idea that anyone in the East really supposed that buildings are heated in the Islands! The original competition drawing shows the facade of the elevation on Bishop Street. A study of the conditions showed, however, that this design, with its enclosed court, was not only inadequate to meet the actual space requirements as they developed but that it would have been ill adapted to the weather conditions in the Islands where it is important that a building be kept thin and open, so that all rooms may have the benefit of the trade winds. Some years later, a new site opposite the Palace was obtained by the Government, and the building was replanned as shown in the illustrations and floor plans included here. The latter show particularly well the form of plan which is best adapted to Hawaiian use.

The court rooms occupy the top floor of the main building between the towers, their long sides exposed to the wind on the court front, and the heads of their arched windows being directly open to the air at the back of the building over the low arcade, which gives access to them. This arcade itself opens out onto the gallery shown in the photograph of the rear elevation, so that the crowd of mixed nationalities, waiting to be called on a case, can loaf outdoors.

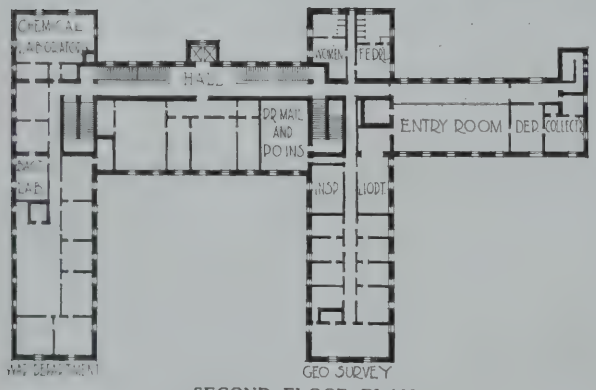
The Post Office is housed in the low quadrangle to the right of the plan, its working space so lighted from overhead as to avoid the direct rays of the almost vertical sun, and its public space being the open arcade on the front and side streets. The Post Office shipping space shows in the rear elevation. The Weather Bureau occupies the tower to the right. Later, Appraisers' Stores will probably be built across the entire rear of the lot.

The building is of steel construction, the walls of terra cotta block covered with white stucco, and the soffit of the heavily projecting cornice and the window frames and seats are decorated in color. The roofs are of irregular Spanish tile.

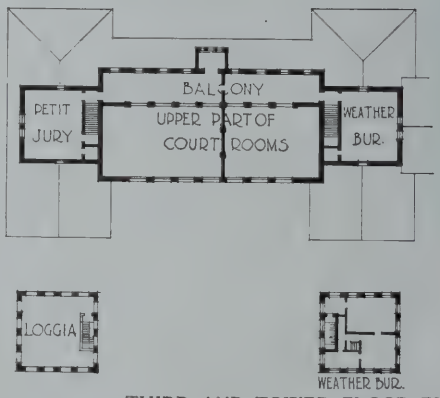
It is to be regretted that the planting, which it so much needs, is still lacking. It is interesting to recall that the other post office which comes to one's mind as making this same provision for the public—a public space in outdoor arcades—is that in Rome, where the court is charmingly planted with semi-tropical trees and shrubbery.

Winning Drawing in Original Federal Building Competition

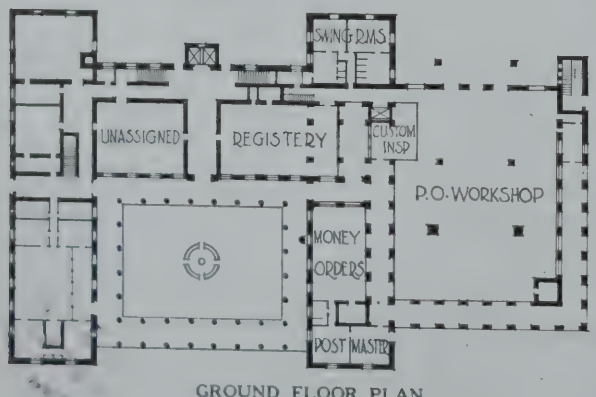
GENERAL VIEW FROM THE AIR



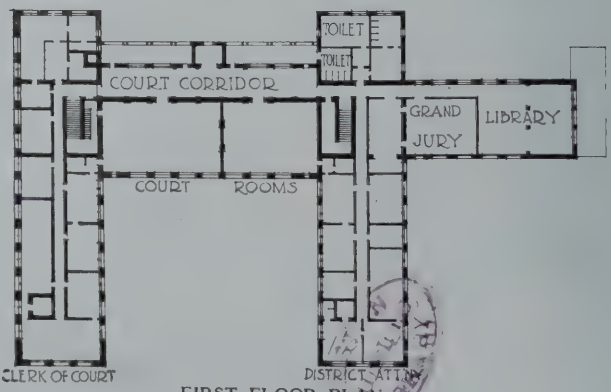
SECOND FLOOR PLAN



THIRD AND TOWER FLOOR PLANS



GROUND FLOOR PLAN



FIRST FLOOR PLAN

FEDERAL BUILDING, HONOLULU

YORK & SAWYER, ARCHITECTS

POST OFFICE DEPARTMENT AT LEFT; CUSTOMS AND COURT AT RIGHT

CUPOLA WITH WEATHER BUREAU APPARATUS

OPEN AIR CORRIDOR OF POST OFFICE

REAR VIEW OF FEDERAL BUILDING, HONOLULU
YORK & SAWYER, ARCHITECTS

LOOKING DOWN COURTYARD ARCADE

A CORNER OF THE COURTYARD

TWO VIEWS OF THE FEDERAL BUILDING, HONOLULU

YORK & SAWYER, ARCHITECTS

The Smaller Civil Architecture of England

THE WOOL MARKET, CHIPPING CAMPDEN, GLOUCESTERSHIRE

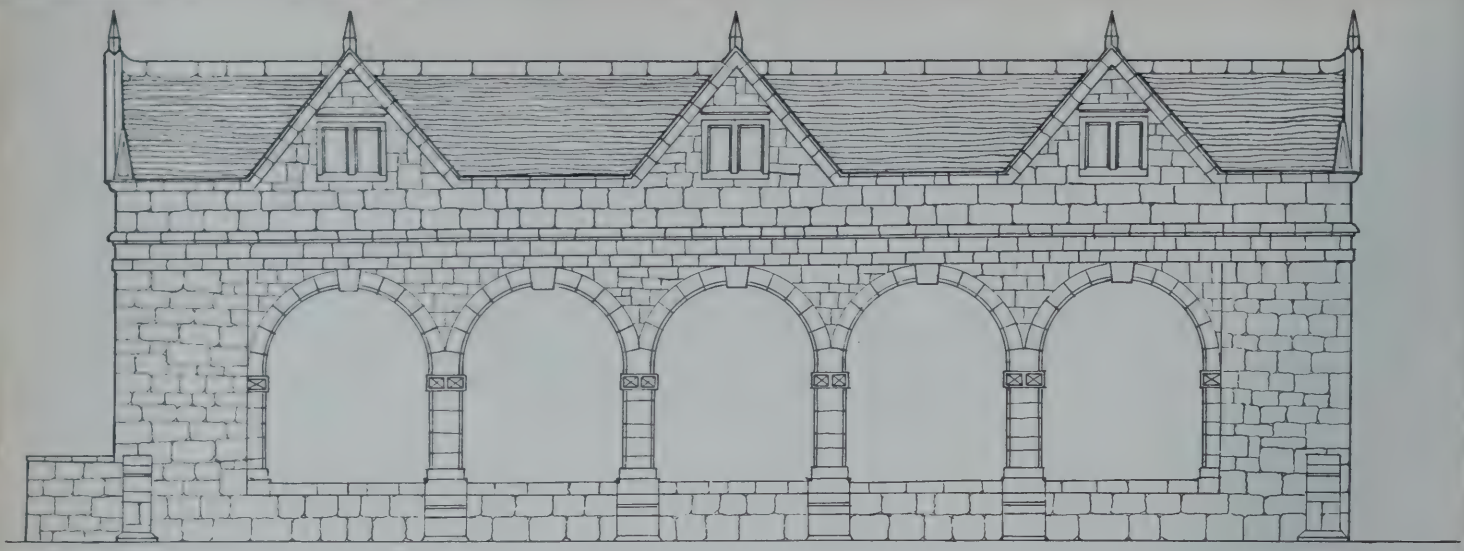
By ROGER WEARNE RAMSDELL and HAROLD DONALDSON EBERLEIN

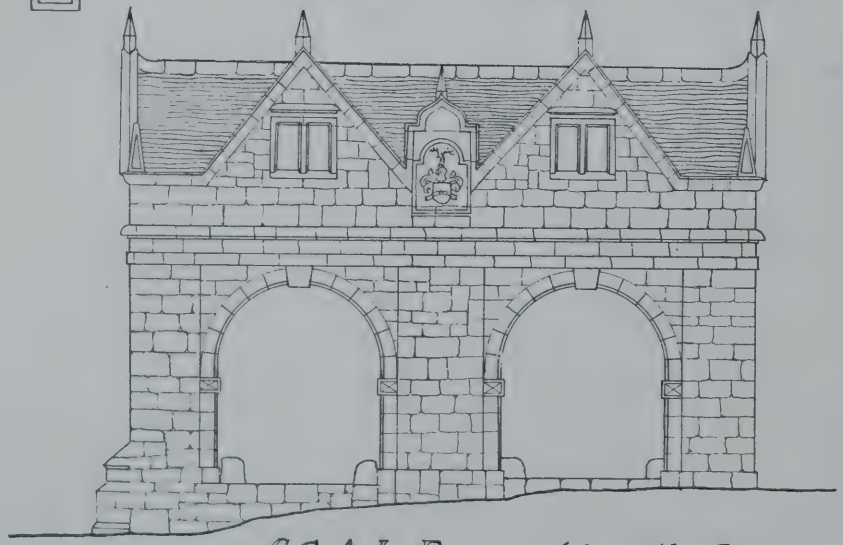
A TWO-FOLD interest is possessed by the wool market at Chipping Campden, in Gloucestershire. It has a distinct interest, in the first place, as an engaging example of minor civil architecture; in the second, it affords an illuminating instance of a refined and tractable material agreeably employed.

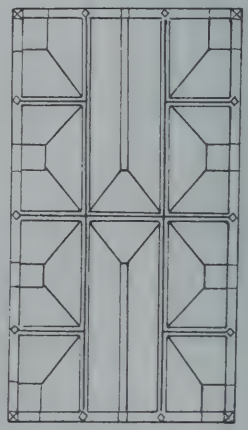
Chipping Campden is a singularly unspoiled town and has been fortunate in preserving its old buildings intact and free from defacement at the hands of the would-be "improver." The harmonious and mellow aspect of the whole village setting helps one to appreciate the feelings of the Cotswold worthy who wrote: "Thank God, there is neither coal nor iron in these hills!" Had there been either of these commodities so indispensable to modern manufacturing industry, we may depend upon it the face of the land would have been completely changed. Instead of drowsing in a quiet backwater and retaining all its pristine architectural charm, the town would have fallen prey, as so many others have already, to the clatter, change and ruin generally attending industrial expansion, and such structures as the wool market would have been swept ruthlessly away. As it happened, the source of Cotswold prosperity was wool, and the market at Chipping Campden is a monument to the last days of the town's importance as one of the centers of the wool trade. As a matter of fact, the very name "Chipping" Campden means "Market" Campden, for hither came the local wool magnates to sell first the clip, and, later, the cloth, and hither came also the Flemish and other Continental merchants to buy the staple for export to the foreign markets.

The wool market, erected in 1627, was built and given to the town by a wealthy benefactor, Sir Baptist Hicks, whose arms may still be seen in the shaped panel between the two gables of the east end. It stands on slightly rising ground at one side of the highway where Sheep Street broadens out to a wide open space, so that its effect as a piece of public architecture is enhanced by the unobstructed view to be had from nearly every angle. Though no longer used as a wool market, the building continues to fill a useful function as a place of shelter and display for miscellaneous wares on stated market and fair days, and in this capacity it carries a wealth of suggestion for structures of similar char-

Exterior of Wool Market, Chipping Campden, Gloucestershire





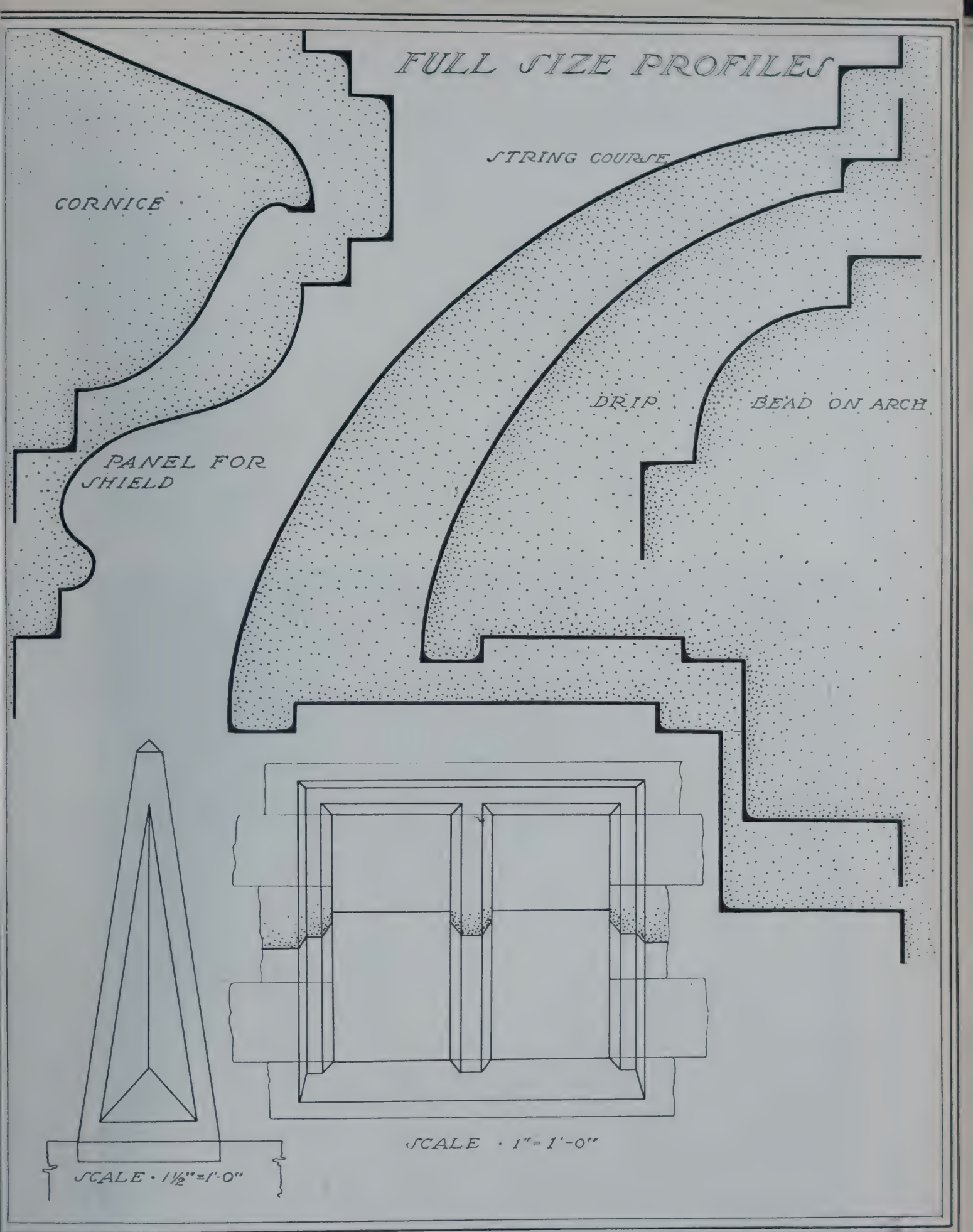


SCALE · 1/8" = 1'-0"

ROOF PLAN

WOOL MARKET

CHIPPING CAMPDEN GLOS.



WOOL MARKET

CHIPPING CAMPDEN GLOS

acter and purpose that might very appropriately be erected today in towns where such buildings could be turned to good account.

The material of which the wool market is built is the local Cotswold limestone, a peculiarly sympathetic and flexible medium, suitable for almost anything the stone mason or master builder may have a mind to do with it. When first quarried, it is soft and of a creamy color. On exposure to the air it hardens and weathers to varied tones of gray, tawny brown and pale buff, with now and then a fleck of soft orange. The different quarries of the Cotswolds yield different qualities of limestone. From some of them the stone comes in large blocks, fit to be dressed for the most exact ashlar or used for carving; from others the output is limited by the natural lines of cleavage to thin layers, and stone of this quality is ordinarily employed for rubble walls. The stone of which most of Chipping Campden is built is of the first mentioned sort.

The customary traditional roofing material of the region is also stone, the same stone of which the walls are constructed. This is true of the wool market. The manner of preparing the roofing stone is of interest. In the autumn large blocks are quarried and left exposed to the weather. The freshly quarried stone is very porous and absorbs a great quantity of moisture, which penetrates between the strata. The frosts of winter then act as wedges, loosening the strata as the water between them freezes. When spring comes, tapping with a mallet is sufficient to separate the layers which are then easily cut to the proper sizes and shapes for the roofing "slats" or "slates" as they are locally called. These stone slates soon weather to a soft gray and collect lichens of a minute growth, or sometimes moss, so that they present an exceedingly agreeable and mellow appearance.

One of these measured drawings shows the roof plan of the wool market, while one of the halftones shows the method of interior roof construction and timber arrangement. Much of the roof has been repaired from time to time, and some of the internal framing is comparatively new, but the old, traditional methods have always been scrupulously adhered to, so that the original work is seen with virtually no change.

View of Interior of Wool Market, Showing Arrangement of Rafters

Architecture at the British Empire Exhibition

By H. J. BIRNSTINGL, A. R. I. B. A.

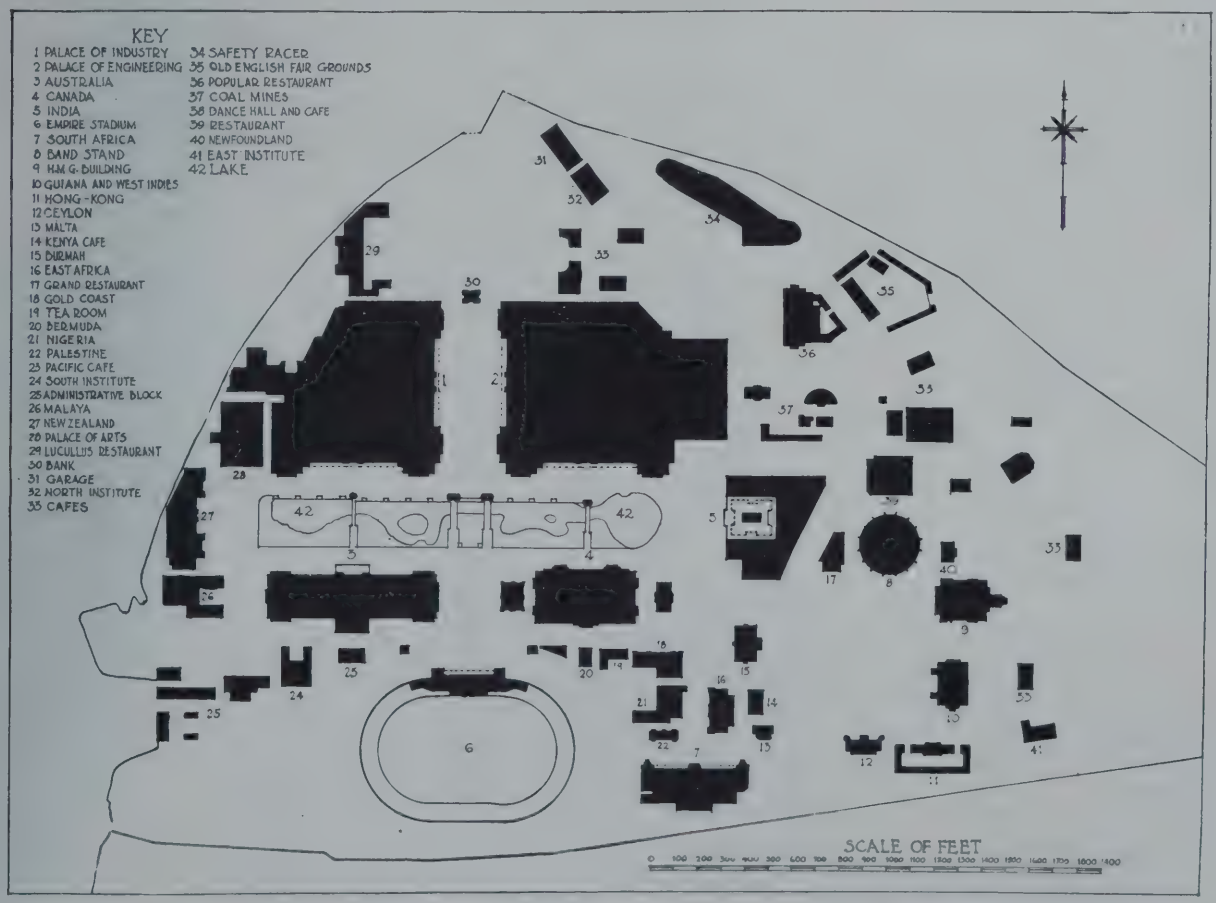
PERHAPS the most distinguishing feature of the British Empire Exhibition is its superb and comprehensive layout, and since town planning, which is a yet broader aspect of comprehensive planning, is one of the most important architectural activities of the day, not only in Great Britain but in many parts of the world, the exhibition, through its layout, becomes at once expressive of the Empire's attempt to produce order out of the chaos resulting from a century or more of uncurbed industrialism.

The site of the exhibition, at Wembley, was chosen on account of its accessibility; 126 stations in central London give access in an average of 18 minutes to the grounds, and two acres have been platformed and turned into a vast terminal.

The main entrance to the exhibition is from the north, from whence a main avenue 200 feet wide leads to the magnificent dominating building, the Stadium. The main east and west axis, passing through the lake, is terminated by the India and New Zealand Buildings. A subsidiary axis crosses the railway and leads to the Amusement Park.

Apart from the Stadium, the two main buildings are those which flank the broad entrance avenue: the Palace of Engineering and the Palace of Industry. These vast buildings cover a joint area of 25 acres. It is difficult to express the exceeding grandeur of their interiors with their great steel roof trusses evenly spaced and fading into dim perspective. Both these buildings, as also the Stadium, the British Government Pavilion, and the Palace of Art, are constructed of reinforced concrete, and every advantage has been taken by the designers to make the most of the characteristics of this material. As far as possible the surfaces have been left in their natural state.

Much experimental work was carried out in the process of building at Wembley, the object in view being always the creating of a method of building which would obviate the subsequent necessity either of covering or of treating the surface by means of sand-blasting, polishing or the like. It was decided that the correct and honest method was to treat the internal faces of the forms, and various types of fluting and reeding were tried with simple recessed and projecting bands, everything being carefully designed so as not to impede the flow of the concrete mixture, which was put in fairly wet and rammed down into the forms and around the



Plan of Wembley Exhibition, Showing Disposition of Principal Buildings

Cloister, Palace of Engineering

reinforcement with iron rods. Of course the ultimate color of the building depends upon the aggregate. At Wembley pure gravel and sand were used, and a characteristic of the finished product is the variety of hues which the surface takes on according to the atmosphere and weather. The unpleasant and monotonous glare of pure white, which has hitherto been favored for exposition purposes, is thus avoided.

Various other problems arose, in connection with the reinforced concrete, which required immediate solution. One of these was the expansion joint. At regular intervals throughout these immense buildings it was found necessary to provide expansion joints. Sometimes it was found possible to cover these joints with an overlapping projection, but here and there they appear naked to the eye, looking like great cracks on the face of the building. This is a matter which no doubt, with the growth of experience, will produce its own satisfactory solution. Another difficulty that had to be faced arose through the slight differences of texture and color between one day's "lift" and another's. With brick or stonework, or where the concrete surface is to have a subsequent treatment, this problem does not arise. In order to overcome it at Wembley a horizontal rusticated treatment was introduced, and the "lifts" were worked to these as far as was found to be possible.

The artificial lake which runs across the center of the grounds is crossed by steep-pitched reinforced concrete bridges. From the summit of these bridges, made steep perhaps for this very purpose, a fine view of the whole exhibition is obtained, particularly to the east towards the Indian section with its spacious forecourt, its cupolas and minarets. This building has been designed by White Allens, and in its vast labyrinth of courts the resources of the various states and provinces are indicated, each having its own appropriate section; moreover, the whole structure, with its lakes and fountains and peculiar architecture, based for the most part on sixteenth century Mogul building, affords an interesting contrast between the architecture of the East and West. Here too is a circular Indian theater, where native performances will take place. Close to the Indian section are situated exhibits of Burmah, East Africa, Nigeria, the Gold Coast, Bermuda, Palestine, each with its appropriate setting. Between these is the bridge over the railway. In designing this bridge the architects have displayed rare psychological insight. A railway running in a cutting seems to afford a natural boundary which, owing to the vastness of the grounds, visitors might all unconsciously hesitate to pass, if it were crossed by an ordinary bridge. For this reason the bridge is flanked by buildings and stalls on either side, simulating, but not imitating, old bridges, such as Old London Bridge, and the *Ponte Vecchio* at Florence. In this way visitors are, as it were, led

Main Front, Palace of Engineering

across the railway without being aware of it. The vista here is closed by the Government Pavilion, and here too the architects have given another display of their insight into human nature. This pavilion is one of the few buildings having two stories, and here again visitors might well hesitate before climbing to the upper floor, the natural instinct being to wander round from building to building on one level. This building, however, is designed with a broad flight of outer steps to the main entrance which is actually on the upper floor; the visitor will then pass down the internal staircase to the ground floor, and so out by a less conspicuous doorway. By such subtle means is he beguiled to the upper story! An interesting feature of this building are the concrete lions which were cast *in situ,* excellent examples of work of the kind.

One Side of the Palace of Industry

South of the Government Pavilion lie the West India group, and those of Ceylon and Hong Kong. The Ceylon building has a broad veranda and is flanked by a pair of squat towers. Hong Kong near by, is a veritable Chinese city in miniature, with its banners, inscriptions and shops. Jamaica, Trinidad, Barbados, the Falkland Islands and the Bahamas all have buildings in this quarter. West Africa is a walled city of three acres with pavilions of Nigeria, Gold Coast and Sierra Leone. There is a mud village throbbing with native life. The East African pavilion, around which are gathered the exhibits of Uganda, Zanzibar, Nyassaland, the Sudan, and Kenya, is altogether different. The predominant effect is of white walls and green woodwork. The building of the Union of South Africa is perhaps the most successful of all the colonial structures with its long veranda supported on coupled columns, its pantile roof, its simple central and terminal features, the whole being obviously based upon the simple Dutch architecture of the country. The building which appeals most to lay visitors is that of Burmah. There is certainly a rare delicacy and charm in this example of the fastidious and exquisite native temples with their dainty fretted spires at the summits of which the temple bells flutter at every breath of the wind.

General View of the Palace of Engineering

In the Palace of Arts is to be found the now famous Queen's Doll House, a gem of architectural miniature work, in the production of which a number of famous architects and artists have collaborated. Every detail is a masterpiece and the best of its kind,—the furniture, the textiles and the books, no less than the mural decoration, the sanitary fittings and the equipment. Here too there is to be seen a delightful nineteenth century period room designed and arranged by Professor A. E. Richardson.

By far the most imposing and interesting building in the whole grounds is the Stadium. Its size alone is prodigious; the over-all length of its major axis is 900 feet, and the maximum over-all width 650 feet. In the center there is a semi-circular headed

oblong of grass measuring 492 by 260 feet, and around this there is a cinder running track. The accommodation for spectators is large; seated grandstands 24,586; ring 9,799; standing enclosure 33,151, and terraces 57,665; total 125,201. There are three entrances to the arena: the royal entrance, the players' entrance and the athletes' entrance. A special staircase enables athletes to reach the royal box to receive prizes, passing up one side, across the front of the box and down the other side. The royal box is situated on the north side and is reached by the royal entrance. The banqueting hall can be entered through the withdrawing room from the box. There is accommodation, comprising dressing rooms, lockers, shower baths, hand basins and lavatories, for about 1,000 competitors. There are also training quarters and a board room. There is a gymnasium with seating accommodations for 250, with a recreation room sufficient for three billiard tables. The main banqueting hall can seat about 1,000 and in addition there are various permanent and occasional buffets and tea rooms.

All round the building there is an almost uninterrupted series of 31 terraces of concrete steps measuring 2 feet, 2 inches and having rises of 1 foot, 1 inch. They are erected on beams consisting of rolled steel joists. These joists are set at a slope of 2 to 1, their lower ends being attached to a reinforced concrete wall and their upper ends to the main outer wall of the building. In the center portion of the covered areas these steps are furnished with lift-up wooden seats 16 inches wide. In the wing portions of the covered areas the seating accommodation is provided by means of planed wood planks fastened to the concrete treads. The roofs have a steel framework covered with corrugated asbestos sheets. The principals of the roof are supported at one end by the outside wall and at the other by pre-cast octagonal reinforced concrete columns 32 feet high, spaced regularly at 43-foot distances apart. Reports regarding tests say:

"On an area intended to accommodate 2,000 spectators a load of sand equal to the weight of 4,000 people was applied, and no signs of weakness were observed. Staircases were subjected to a similar intensity of loading with equally satisfactory results. A battalion of 1,200 men marched about the Stadium in close formation. They stood and sat in unison, they marked time in step, and they swayed and surged upon the barriers. No dangerous strains were caused by these operations."

Various well known architects are responsible for the designs of various stalls within the palaces, and of individual buildings belonging to private firms which are exhibiting. Among these must be mentioned the *Times* Building, the work of Phipps & Milne, a beautiful, dignified building placed on the main axis, its low, simple, clearcut form contrasting pleasantly with the massive Stadium.

Considering the architecture generally, there are those who think that it shows insufficient modernist tendency. But England is a country so rich in architectural tradition that it was rightly thought that the exhibition should to some extent typify this aspect, rather than display some passing and ephemeral phase, especially as many of the buildings are to remain as a nucleus of permanent exhibition grounds. Here a remarkable degree of success has been achieved. The buildings are at once new in treatment, for never in this country has such use been made of reinforced concrete, and yet they are redolent of national architectural character.

The British Government Pavilion

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Duct Work in Connection with Ventilation

By C. W. KIMBALL

ONE of the problems which an architect or engineer frequently encounters in planning new buildings is how to provide adequate accommodation for the ventilating ducts, and in some buildings it is quite difficult to provide the required space in the right places. However, when we considerable that favorable air conditions in a building are a necessity and not a luxury, it seems worth while to give this part of the building careful consideration.

While the duct system should be planned so as to fit into the building detail, it is also true that it should be carefully considered in planning the building and due allowances be made to get the duct work in in such a way that the owners do not have to spend money each year for power to force the air through long, crooked and undersized ducts. Many times by slight adjustments in the building detail the duct system can be simplified, the maintenance cost can be cut, and a more satisfactory system installed. Too many times, however, the instructions are to "work them in somehow," and thus an extra burden in first cost and in operating costs is turned over to the owner because the flues were put in where nothing else could go. The duct systems should be kept as short as possible, have as few turns, elbows, risers and drops as may be, be as nearly airtight as good workmanship can make them, and be constructed either of galvanized iron or of the various building materials as outlined here.

To illustrate the effect the elbows have on the air delivery, tests show that an elbow in a round pipe, with a radius the same as the diameter of the duct, brings a 25 per cent loss in velocity, while an elbow with a radius half the diameter of the duct brings a 70 per cent velocity loss. An elbow with a radius equal to twice the diameter of the duct means only a 15 per cent loss. On square ducts the elbow having a center line radius the same as the width of the duct will bring only 17 per cent velocity loss, while the elbow with a center line radius one and one-half times the width of the duct brings only 8 per cent velocity loss. From this it can be seen that the number and type of turns and elbows have a marked bearing on the loss of velocity and the increase of friction loss, and that these losses really determine the air delivery at the various openings.

Another condition the ventilating engineers frequently encounter, which is the source of a great deal of expense in the operation of a system as well as loss in efficiency, occurs in the interference between the ducts, the pipes, hangers, beams, etc. which are frequently put in prior to the installation of the duct system. The architect and engineer, in laying out the work originally, can easily arrange to prevent such obstructions. It is obvious that any pipes or other fittings, except registers and normal ventilating openings into the duct system, are a source of leakage which frequently is difficult to prevent and much more difficult to overcome, unless the proper precautions are taken at the start. There is no doubt that architect and engineer frequently assume that the ventilating engineer can get around these difficulties, but if the engineer has to guarantee the efficiency of the working of this system it would be an injustice to ask for a guarantee unless the architect and engineer laying out the building are willing to coöperate in preventing conditions of this kind from arising.

In the usual construction of schools, theaters, churches, etc., the available materials are galvanized iron, brick, tile, gypsum, wire lath, plaster and concrete. Of these galvanized iron is the best, without reference to cost, because it is smooth, comparatively tight, easily adapted to building construction, and is installed quickly. Brick, concrete, tile, gypsum and wire lath and plaster follow about in this order. The brick flues with ruled joints and brushed surfaces come next to the galvanized iron and in many cases are cheaper than the galvanized iron. Tile and gypsum flues if laid up with smooth surfaces and tight joints can be used, but extreme care must be taken to insure tight joints and to see that no heat and vent ducts come next to each other unless there is a double wall between. If the flues are adjacent with only one thickness of wall between, the leakage due to pressure on one side and the suction on the other will bring a loss of air into and out of the rooms due to the fresh air under pressure finding its way into the vent duct which is under suction and thus short circuiting. In no case should tile or gypsum be used unless the smooth type is selected or the flues are carefully trowel plastered and made tight and smooth inside. Experience has shown that with the gypsum flues the mortar is likely to dry and work out of the joints and thus cause excessive leakage, which injures the value of the system.

In selecting the material to be used for ducts, the

construction of the building, its use, locating of flue, adaptability and first cost are the main items considered. In second class buildings galvanized iron flues are used almost exclusively unless the corridors and corridor walls are fireproof, in which case masonry flues are preferable. In first class buildings both sheet iron and masonry flues are used, depending upon the location of flue spaces on the different floors and the general design of the building.

Under present-day conditions sheet iron work for flues is quite expensive, and if by proper planning the main air ducts and the flues can be made of building construction, it has been found to reduce very materially the cost of the heating with little if any appreciable increase in the cost of the building construction. This has been worked out many times and has demonstrated that a little time and thought put into the planning of the building so as to simplify the duct and flue work and allow the use of masonry will result in a substantial saving in the total cost of the building. This list of building costs would seem to bear out this contention:

1.	School,	32	cents	per	cu.	ft.	Masonry flues
2.	"	33	"	"	"	"	
3.	"	38	"	"	"	"	
4.	"	42	"	"	"	"	Galvanized iron flues
5.	"	46	"	"	"	"	
6.	"	45	"	"	"	"	

For gravity ventilation the ducts and flues should be carefully planned and installed, as the only power available to move the air is the heat from the radiation. The gravity ducts should not be planned or installed in such a way that the heated air must go downward at any point, but everything should be made favorable for the upward flow of the air throughout the entire system. The carrying capacity of flues under gravity conditions depends on the height of the flues from the indirect radiators, or in the case of vents the height from the room to the vent head.

This table affords a guide in proportioning the velocity of the air from the fresh air radiators into the rooms:

Floor registers with indirects just under,	150	ft.	per	min.
Wall " up to 8 feet	230	"	"	"
Registers on second floor	300	"	"	"
" above second floor ceiling	350	"	"	"

In the vent flues a maximum velocity of 300 feet per minute from the first floor and of 260 to 275 from the second floor is as great as can be depended on without fans or excessively large accelerating coils. As a word of caution, however, it has been found that the most satisfactory results are obtained in gravity ventilation when the flues are oversized 15 per cent to 25 per cent, as too often during construction there is more or less leakage into and from the flues, and if the flue sizes are kept too close to the theoretical sizes there may be trouble getting the exact volume planned. In planning any duct or flue system for forced or fan ventilation the engineer must assume certain conditions and make due allowance for elbows, bends, obstructions, and in many cases poor construction. These elements have much more of a bearing on the final result than is sometimes appreciated, for the fan is designed to give a certain pressure and velocity in the ducts at a certain speed. If in installing the duct work the contractor does poor work or the building construction necessitates short-turn elbows and offsets, a well planned system may turn out to be a poor working system. The writer recalls a system planned and installed to deliver 60,000 cubic feet per minute to various rooms. On the first test the system only showed a delivery to the rooms of approximately 28,000 c.f.m. A week's work on the duct system, stopping leaks, straightening ducts, etc., made the system deliver approximately 56,000 c.f.m.

Another point which should be kept in mind is that if some responsibility for air delivery and diffusion is put on the installing contractor it will have a decided tendency toward making him careful to get the ducts tight, the bends and changes of shape correct, and to place all necessary volume dampers so as to be accessible and regulate correctly the flow of air. Without this responsibility carelessness may creep in, as due to competition, the tendency is to put the work in as quickly and cheaply as possible, leaving the trouble of adjusting the distribution and volume to someone else who is bound to be handicapped by the poor construction. This was well illustrated on an installation of rather large size recently, where the galvanized iron foreman had, for the first time, the job of setting dampers and equalizing the flow of air to the rooms. After going through this he remarked that the next job he did he would see that all dampers were easily accessible without having to crawl through ducts, and that he could now see the necessity for careful work in installing the entire duct system.

As to selecting the correct size fan, motor and duct system, there are several different rules and tables that help in this, yet experience is an important factor in obtaining satisfactory results. To get at the amount of resistance the fan has to overcome in performing its work, both on the suction and discharge side, these items are to be considered:

Fresh air inlet to heaters; size, length and construction.

Vents or pipe coil heaters; numbers of banks, spacing and location.

Filter or air washer (if used); type, kind and service required.

Construction of fan room.

Duct system (horizontal); materials, bends, lengths and sizes.

Flues and openings (vertical); materials, lengths and offsets.

Careful attention should be paid to the arrangement of all these parts to see that friction is kept at a reasonable point as to both first costs and operating costs. On the air inlet to fan the area, length, number of grilles, and number of bends determine the friction loss here, and the resistance may vary

greatly, so no hard and fast rule can be presented.

When there is an opening through the wall of the building with just a guard, and the area of the windows is such that not over 800 to 1000 feet velocity develops, very little or no friction loss occurs. The fresh air filter to screen the air may add from .1 inch to .5 inch resistance. The air washers of the standard type will generally add .2 inch to .3 inch resistance, while cheesecloth filters, unless amply proportioned and kept clean, may add .5 inch. The vent heater coils for school and public building work should be proportioned, generally speaking, so that a velocity of 1000 to 1200 feet only is required, and in this way it is possible to keep down friction here to .1 inch approximately. When the question of duct system and flues is considered the size, length and number of offsets, changes in shape and number and character of bends, also the class of work done in the installation, all have a direct bearing on the friction loss.

As a matter of precaution in planning for the final results it should be borne in mind that numerous unexpected contingencies will arise during construction that cannot always be foreseen, and if the duct system is figured too nearly according to theory something will occur during construction that will upset the final result. In factory or industrial work where the ducts are run exposed it is possible to proportion the duct work more nearly exactly, for room is provided for the ducts and very little interference occurs with construction. In schools, hospitals and churches, however, the duct work must be concealed and is generally crowded. With this in mind, and with years of experience as a guide, we find it much better to figure somewhat in excess of the theoretical values so that trouble is avoided when the system is all completed and in use. If the velocity in the main ducts near the fan is kept down to from 1000 to 1200 feet per minute, and gradually reduced to 800 and 600 as the distance increases, and if the velocity in the main branches is kept down to 500 or 600 with the smaller upright ducts down to a velocity of 300 or 400 feet per minute and not over 300 feet per minute velocity through the grilles, the average schoolhouse, theater, hospital and similar duct systems will not develop more than .3 inch to .5 inch resistance or pressure. It is true that most of the manufacturers formulate tables of fan ratings with the speed, horse power, etc., carefully indicated on them. In making preliminary drawings one can frequently take at random from these tables, the size of fan and of motor necessary to deliver the amount of air required. Such conclusions, however, should not be considered as final, accurate and complete, until they have been finally checked over, because there is a great difference between the operation of a fan under a free delivery and a fan under static pressure.

If the fan and ducts are installed with a capacity of from 10 to 20 per cent in excess of the actual and theoretical requirements, the interest of the owner is safeguarded throughout and the system is more nearly sure to pass the required tests. Also, it is much easier to reduce the air deliveries than it is to increase them once the fans, motors and ducts are installed. With the proper sized motor and duct work, all that is required to reduce the air delivery is a change in pulley sizes, while to increase the delivery to any appreciable extent, if the whole apparatus is held too close to the theoretical requirements, it may mean a new motor or possibly a new and larger fan. There are numerous charts and rules to aid in figuring friction loss in the duct system, yet they are somewhat cumbersome and complicated, and with the varying conditions in modern buildings, the experience of the past work is a help.

As to the testing of the system after installation to determine the air delivery to and from the various rooms, the anemometer is the measuring instrument most frequently used. Unfortunately, the instrument is very delicate and easily put out of adjustment; also, it is susceptible to a great range of error, dependent upon how the instrument is held in the path of the air. The anemometer gives the velocity of the air passing through it, and this velocity multiplied by the area of the grille or opening being tested gives the number of cubic feet of air passing through the grille.

In the past it has been the custom to subtract a certain proportion of the total area of the grille to allow for the metal or plaster members of the grille, but experience and tests show that if the anemometer be held approximately 2 inches away from the grille, there is no need to subtract for the solid members of the grille since the obstruction has its effect on the anemometer and slows up the velocity of the measuring instrument sufficiently to compensate for the obstruction of the grille work. This is still a somewhat disputed point, yet the tests made convince us that this method will give as nearly correct results as the older methods.

Another important point to consider is whether to use one large fan and heater unit or to use two or more smaller units and thus reduce the size and length of the main duct system. Our experience shows that much better results are obtained at no increased cost if the two or more units are used, properly located with reference to the duct system, and the entire work is generally simplified.

The subject of duct work is too extensive to permit of complete analysis in one short article. The static pressure, the calculations for fan sizes, for motor sizes, and the arrangements of deflectors and dampers are all of exceeding great importance. Another article will be devoted to the mathematical phase of the duct system. The need of a discussion such as is here presented is at once apparent to the ventilating expert when he sees the crimes committed in the name of a ventilation system by inexperienced engineers. The value of such a system is more dependent upon the intelligence with which it is designed than upon its cost in dollars and cents.

Details of the Salons, Chateau de Montfermeil, Paris

TWO SIMPLE INTERIORS IN THE STYLE OF LOUIS XIV

Drawn by C. HAMILTON PRESTON

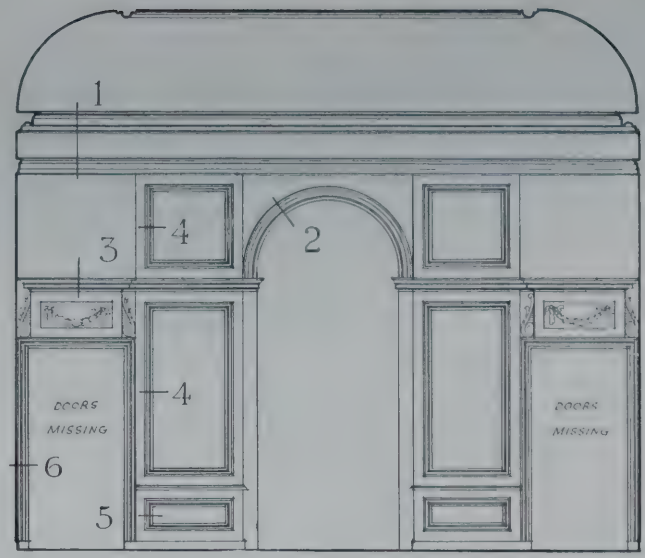
IN one of the remote suburbs of Paris is the lovely old Chateau de Montfermeil, fast going to rack and ruin through long neglect and desertion. Historically, little is known about the building or the owners of this unusual example of French Renaissance architecture. The care devoted to the proportion, scale and balance, exhibited in all the interiors of this house, has produced a charming dignity well worthy of emulation by modern designers.

Of the many splendid interiors, measured drawings of the two salons which are shown herewith give an adequate idea of the delicate refinement of detail found in cornices, wainscot and trim. Unfortunately, line drawings can give no impression of the color used in these rooms. The walls and mouldings of the salon with niches are painted gray, in contrast to which the niches are marbleized in yellow, one of them having a deep colored bloodstone fountain; blue-green is used in the panels over the doorways. In the salon where reed mouldings are used to emphasize the wall panels, the walls and trim are painted a grayish green. Black and white marble floors, hexagonal in pattern, give a rich ground for the lighter colors of the walls and ceilings in both salons.

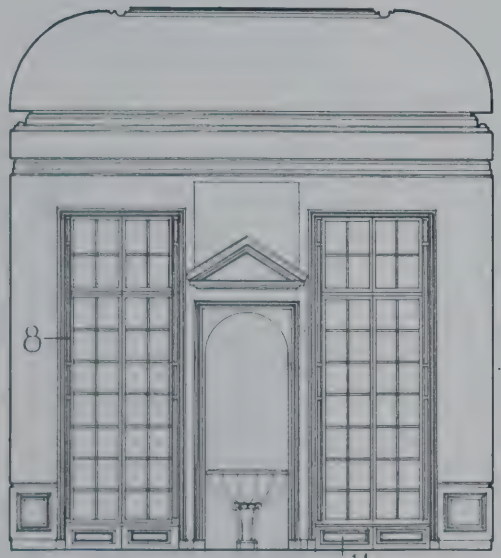
The floor dimensions of each salon are 20 by 26 feet, a pleasing proportion, but in the salon with niches the ceiling rises in a deep cove 4 feet above the cornice to a total height of 22 feet, which is 5 feet higher than the ceiling of the salon with reed mouldings. In the casement windows or doors in opposite walls of the salon with niches, which are 14 feet high, the glass panes extend almost to the floor, where a very low sill with paneled front forms a step, giving the impression that this room might have been used as a connecting hall or anteroom between gardens at the front and back of the chateau. This idea is still further suggested by the marble wall fountain and marble floor. The balanced treatment of all four walls of this room is especially interesting, particularly the treatment of the space between the end doors, where the side walls are broken up by beautifully proportioned arched wall panels very slightly recessed, flanked by three small vertical panels extending to the cornice line. The string course mouldings, from which the arch mouldings spring, are carried across as a cornice or cap for the decorative panels over the door openings. Due to the large number of doorways and windows in this room the low wainscot panels occur in only eight narrow spaces, probably to increase the effect of height in the walls above. In fact, everything possible has been done to emphasize the height of this salon by the use of tall, vertical windows, wall arches, niches and panels. The four door openings would appear very low, although over 8 feet high, if their apparent height were not increased by the ornamental panels above them, in which appear the only carved details in the room. Another interesting feature is the pediment which occurs above each of the niches, forming a crowning motif to this detail, and preventing the niche panel from appearing too low in comparison with the very tall windows on either side. The contours of the various trim and cornice mouldings in this salon, are exceptionally fine, indicating great care in their design and execution. This regard for the least important detail of the design, as well as the most important matters of scale, proportion and balance, gives to this salon great dignity and refinement.

In the salon with reed mouldings still greater simplicity and delicacy of detail are found. The wall panels, which are emphasized by reed mouldings, show a low wainscot cap with panels below. The casement windows in the north wall of the room extend to the floor as doors, in the bottom of which panels equal in height to the wainscot occur. In the east wall the windows extend only to the sills, which are level with the wainscot cap. The divisions of the walls in this salon fail to show the same balanced treatment shown in the walls of the salon with niches, but a similarity in panel widths keeps the scale uniform. The spacing of windows and panels on the east wall shows a difference in width at the corners, which is hardly noticeable on account of the simplicity of the treatment. The south wall, which is a masterpiece of dignified design, has three wide and two narrow panels, in the center panel being a finely proportioned door opening with pediment above. The contour of the mouldings of both pediment and door trim, is a delicate combination of reversed curves, three-quarter rounds, and flat planes. A plain ceiling, without the deep cove occurring in the salon with niches, rests directly upon the well proportioned cornice, successfully tying together the walls of this remarkably beautiful room.

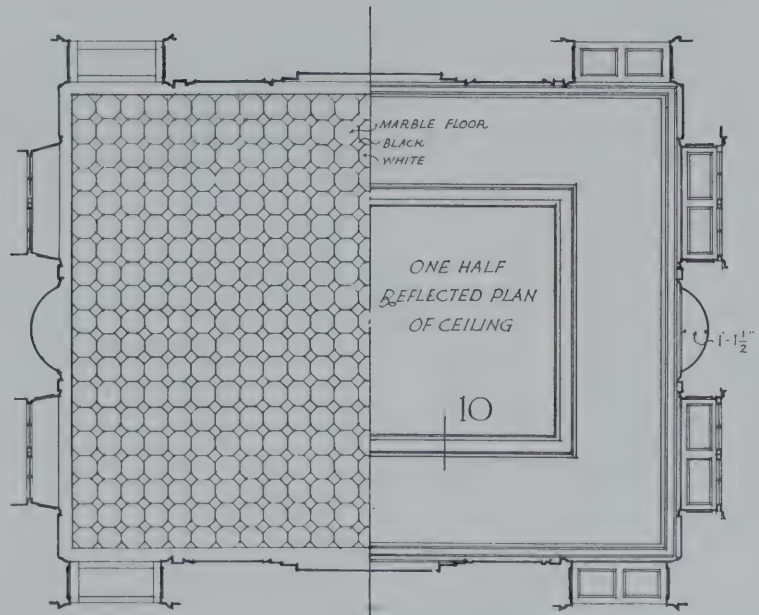
NORTH ELEVATION

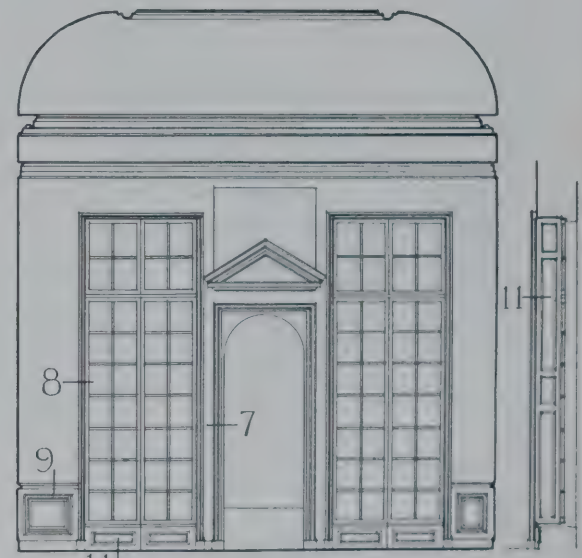


SOUTH ELEVATION



EAST ELEVATION





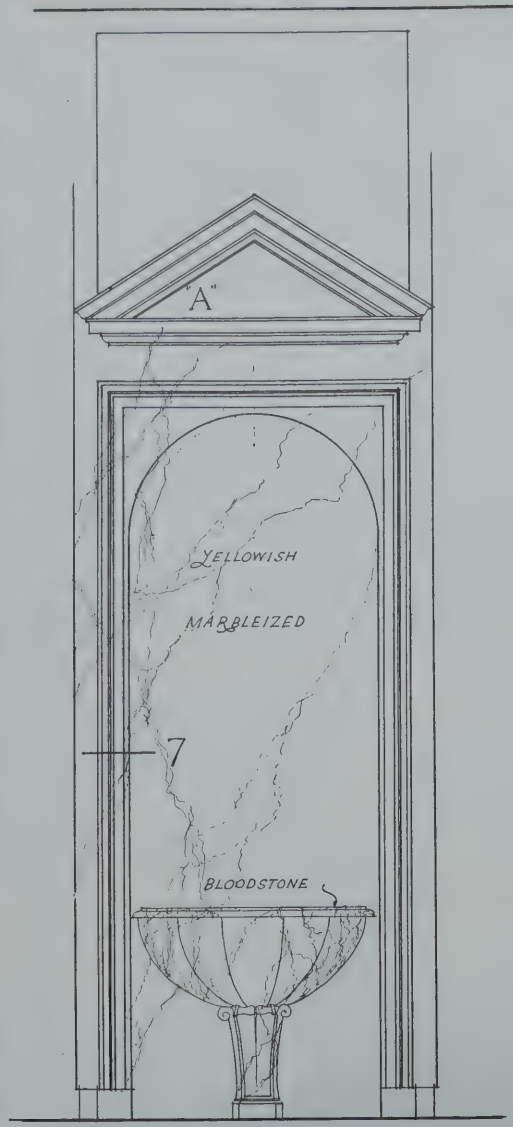
WEST ELEVATION

SALON

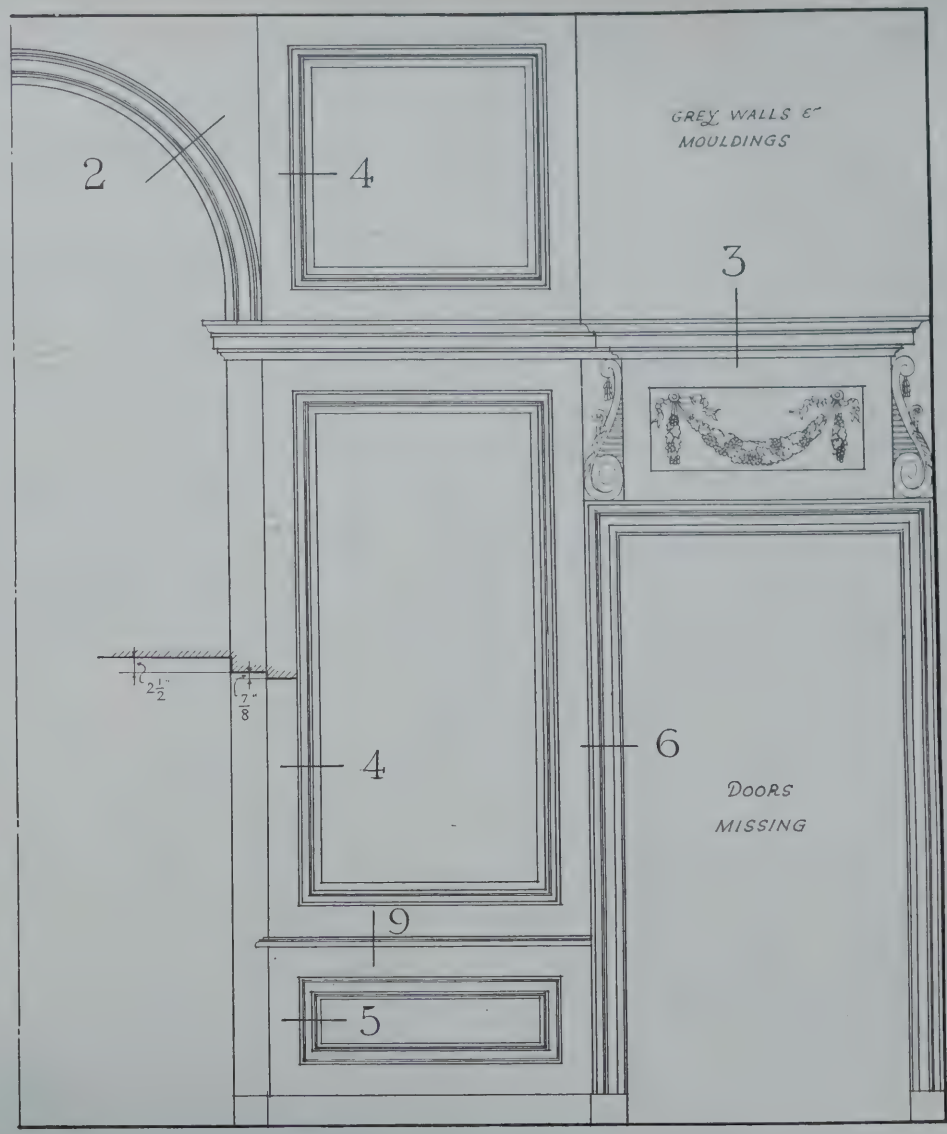
Scale $\frac{1}{8}$" = 1 Foot

CHATEAU DE MONTFERMEIL

BOSTON PUBLIC

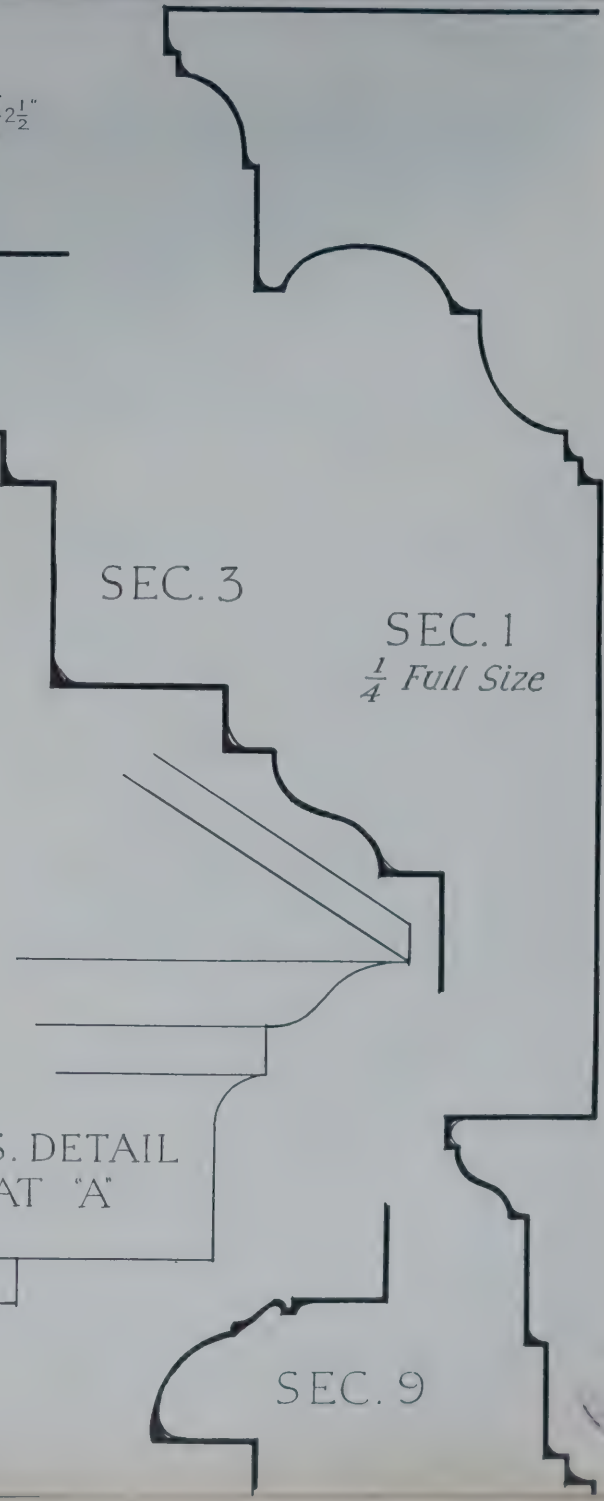


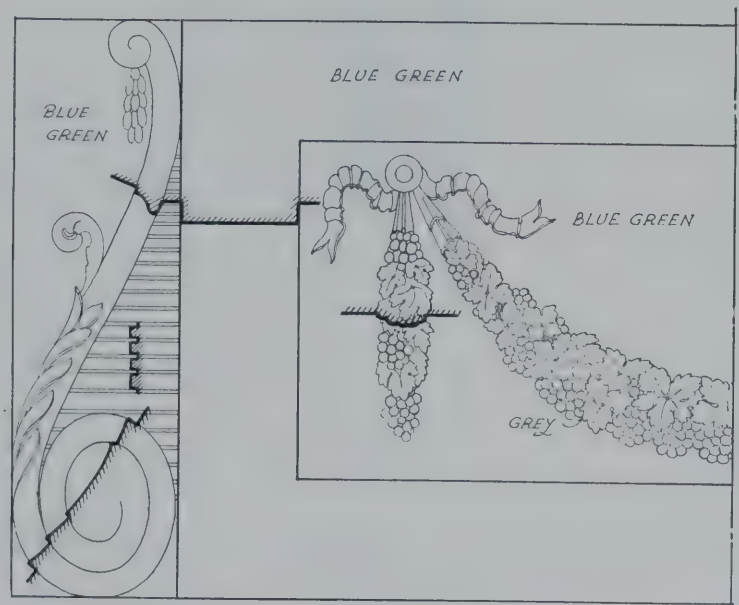
DETAIL OF NICHE



ONE HALF OF NORTH ELEVATION
Scale 3/8" = 1' Foot

SALON
CHATEAU DE MONTFERMEIL

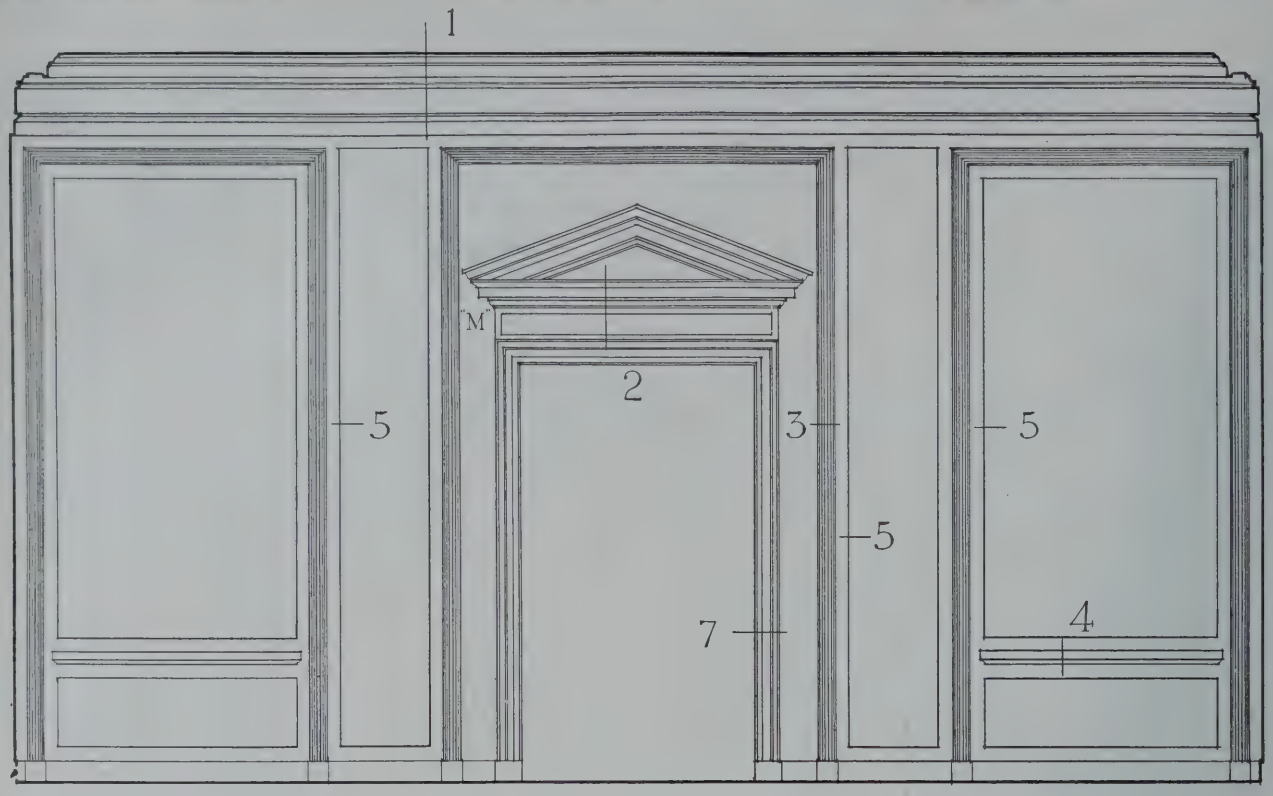




½ DETAIL OF PANEL OVER DOOR
Scale 1½" = 1 Foot

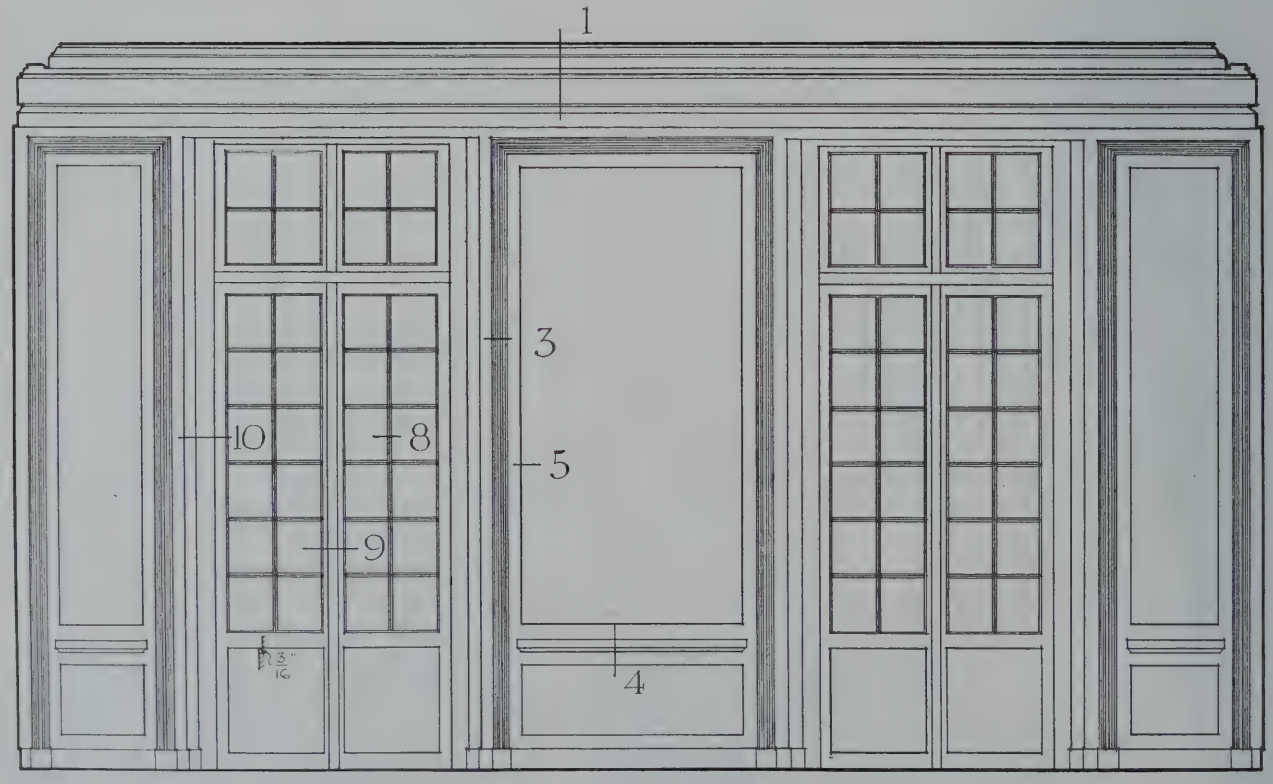
½ F. S. DETAIL AT "A"

SALON CHATEAU DE MONTFERMEIL



SOUTH ELEVATION

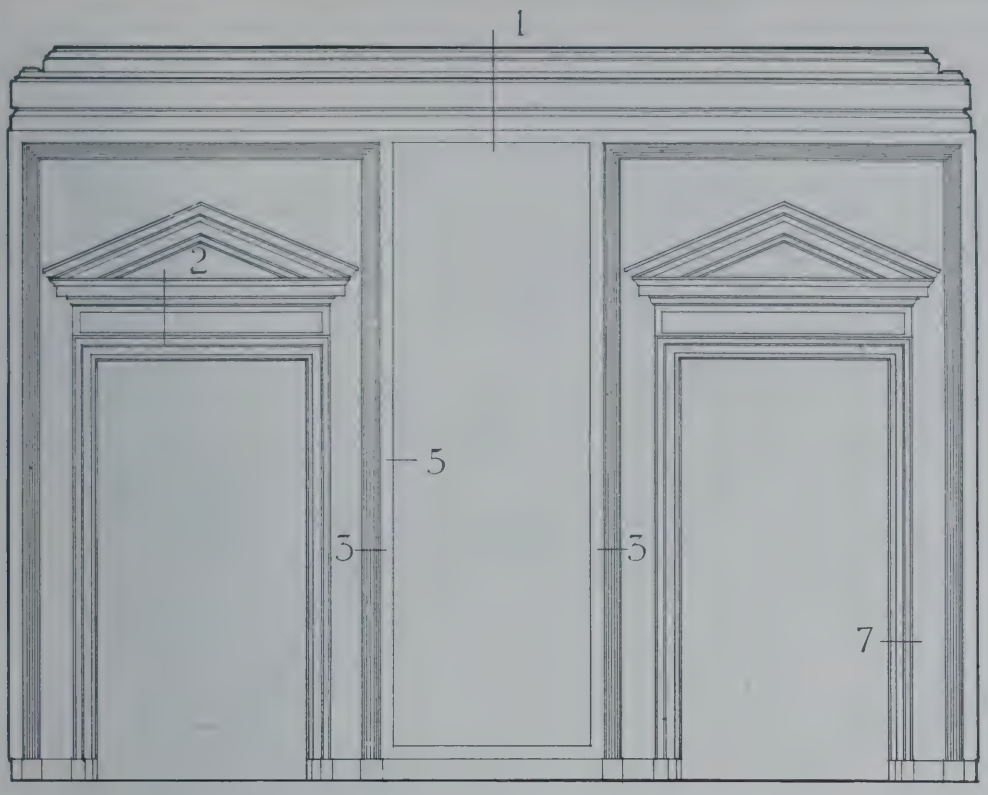
Scale $\frac{1}{4}$" = 1 Foot



NORTH ELEVATION

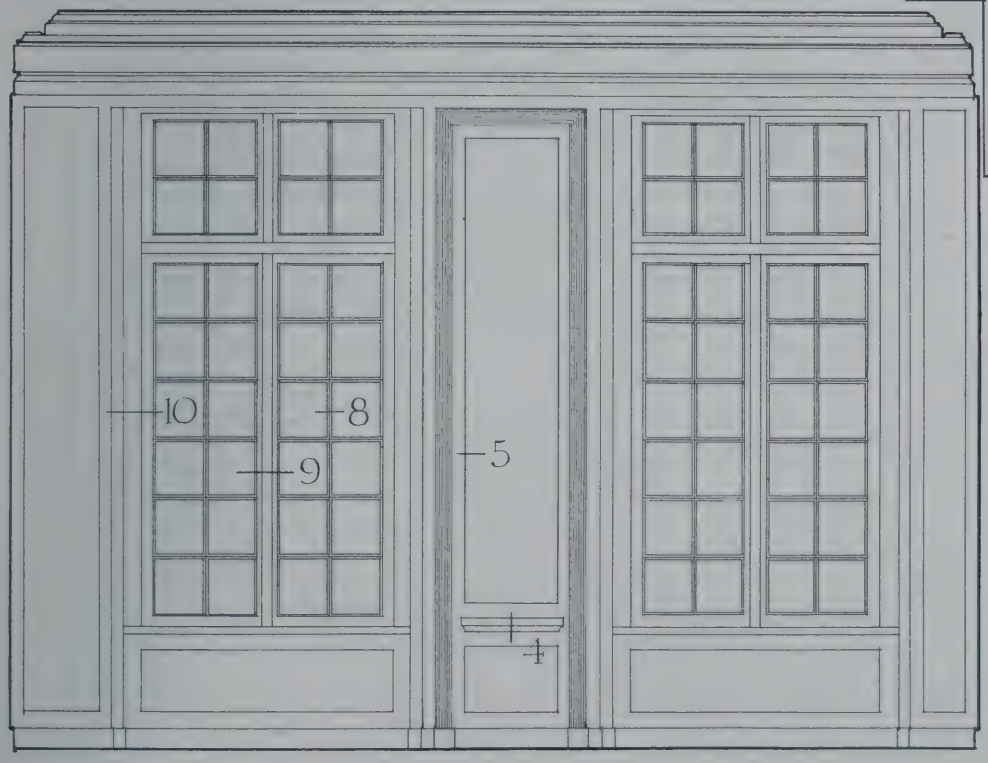
SALON

CHATEAU DE MONTFERMEIL



WEST ELEVATION

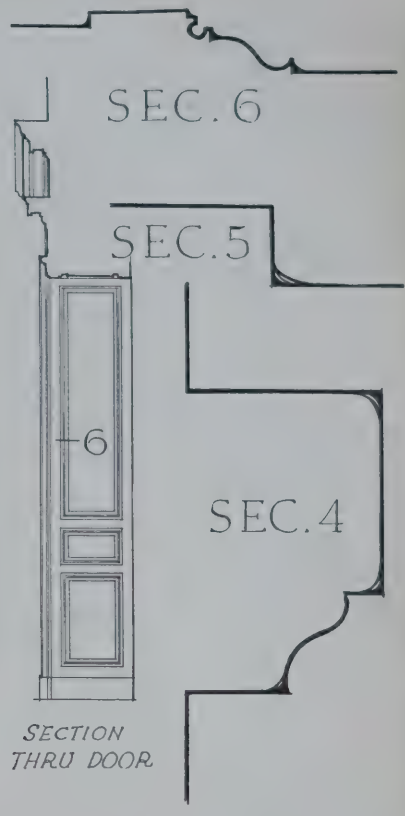
Scale $\frac{1}{4}$" = 1 Foot

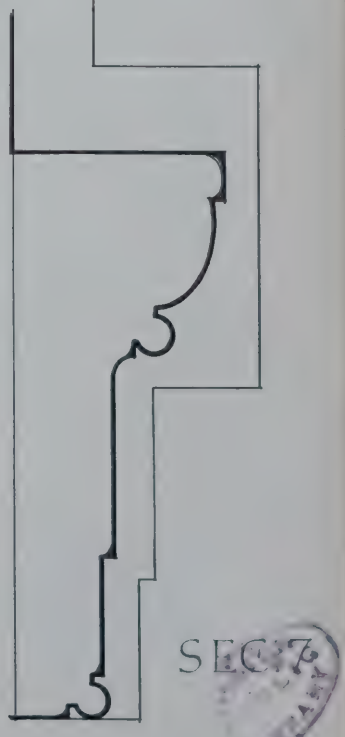


EAST ELEVATION

SALON

CHATEAU DE MONTFERMEIL



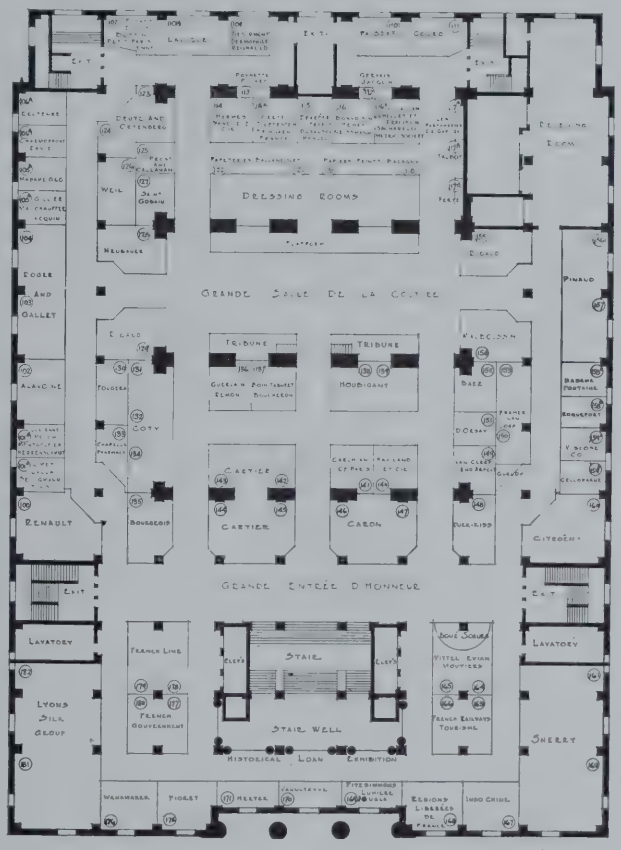


1/2 F. S. DETAILS OF SALON
CHATEAU DE MONTFERMEIL

Plate Description

THE FRENCH EXPOSITION, Plates 10-12. At the Grand Central Palace, New York, an exhibition was recently held for the purpose of better acquainting the American people with the art, handicraft and industries of France. Although the beauty and variety of the exhibits displayed in the many *salons intimes* were remarkable, the architectural setting was a still more notable achievement.

Through the fortunate selection of Howard Greenley, Architect, as Art Director, there was designed for this exposition an artistic and architectural setting of unusual charm and consistency. Taking the existing plan of the exhibition floor with its various structural elements, a plan possessing balance and symmetry was developed which provided corridors and courts along which were arranged little rooms or salons, each complete with ceiling and four walls, thus obviating the usual haphazard arrangement of open stalls of varied sizes and schemes of decorations.



Plan of the French Exposition
Howard Greenley, Architect

As may be seen from the plan shown on this page, the two courts or large halls were logically located where the greatest crowds would be most likely to congregate, one called the *Grande Entree d'Honneur,* at the head of the main entrance stairway, and the other, designated the *Grande Salle de la Couture,* which faced the curtained stage where Parisian manikins displayed the latest models of the famous French dressmakers and designers.

The permanent architectural features such as columns, pilasters and balconies of the exhibition hall were cleverly combined with and concealed by the temporary architecture, to produce an adaptable and uniform design. A perfection of scale was accomplished, as evidenced in the plate illustrations, by constructing low vaulted corridors and open arcades upon which all of the display rooms opened, and an effect of permanency was secured by marbleizing the pilasters and halls and by soffits. Massive architectural vases of great dignity marked the arched openings of several corridors, as shown in Plate 10.

HOTEL ROYAL BERMUDIANA, Plates 13-16. At Hamilton, Bermuda, a hotel has recently been built from the plans of Warren & Wetmore which seems indigenous to the island. This effect has been accomplished by preserving to a large extent the existing trees and shrubs and by designing and constructing the building in a manner characteristic of Bermuda, and suitable to a semi-tropical climate.

Two of the finest estates in Hamilton were purchased for the site, and the old mansions built a century ago demolished to make way for this latest hostelry. The semi-tropical planting of the old estates was so exceptionally fine that it was decided to locate and plan the hotel in such a way as to preserve and take advantage of this wonderful asset. Commanding a fine view of the sea, pergolas and porches, covered with the gorgeous orange and purple bougainvillæa, enclose the south court, which was planned to include without disturbing several fine old trees.

The building is planned around three sides of an open court, with the grill room in a projecting wing, which makes it possible for both the restaurant and the grill to be open on three sides, with the arcade upon which the lounge opens continuing along one side of the restaurant. These are all large, well proportioned, airy rooms, made cheerful by gaily colored hangings, furniture coverings, rugs, lamps and lighting fixtures which contrast pleasantly with the light gray and white used throughout for the wall colors. In the bar, which is reminiscent of England, a delightful atmosphere has been secured through the combination of old English brick with antique cedar beams in panels for walls and bar front.

Although money was lacking to supply the window shutters and iron balconies planned to enrich the plain white walls of the hotel, the simple dignity of the building with its well spaced and carefully proportioned windows is very pleasing. It connotes perfectly its purpose and place,—a semi-suburban hotel in a semi-tropical climate.

EDITORIAL COMMENT

57th CONVENTION, AMERICAN INSTITUTE OF ARCHITECTS

IT seems to be the unanimous opinion of all who attended, that the recent meeting of the Institute in Washington, for which a program of unusual interest and variety had been arranged for three days, was among the most successful ever held.

The program for the first day included not only the President's address and his impressive eulogy in memory of three of the country's foremost architects, Henry Bacon, Bertram Goodhue and Louis Sullivan, the presentation of reports by the various committees and the Board of Directors, containing many suggestions of constructive value, but also an afternoon discussion of "The Public Building Problems of the United States," under the chairmanship of Milton B. Medary, Jr., in which prominent representatives of the Government set forth the financial and construction problems encountered in public building and asked for the support and the active interest of the architects of the country in furthering the program of building construction and supporting the budget system of government financing. A lecture on Rome by Albert Kelsey ended the afternoon session, which was followed in the evening by a report of the Committee on Education, in connection with which papers were read by William Emerson, George C. Nimmons and by Ellis F. Lawrence.

After the nomination of officers on the second day of the convention, which resulted in the very fortunate selection of D. Everett Waid of New York for President of the Institute by unanimous vote, Robert Taylor Jones gave a talk on the invaluable and but little understood or appreciated work done by the Architects' Small House Service Bureau. H. Van Buren Magonigle devoted the afternoon session, of which he was Chairman, to a discussion of perhaps the most vital and fundamental characteristic of American architectural design today, entitled, "What is Precedent Doing to American Architecture?" This discussion included most interesting and illuminating papers by Ralph Adams Cram, William L. Steele, Walter R. B. Willcox and William A. Boring, as well as by the Chairman himself, which stimulated a new appreciation and aroused a latent realization of the unconscious influence precedent has gained in the phraseology of our architectural vocabulary. Each author approached the subject from a different point of view, some defending and some decrying what has come to be the underlying principle of architectural design in this country. It was a timely attempt to open the eyes of our architects to the insidious effect upon original and creative design of a trained and systematic subservience to precedent, which in its most blatant and abortive examples, as Mr. Magonigle so truly said, becomes gross plagiarism.

Reports of the Committee on Architectural Relations and on Competitions were received and discussed on the evening of the second day, followed on the morning of the last day by the completion of unfinished business and the report of the Committee on Resolutions. After a sociable luncheon at the Washington Hotel, the afternoon meeting of the convention, with which it ended, included the announcement of results of the vote for officers, taken the preceding forenoon, and a reception tendered by the Secretary of Commerce, the Honorable Herbert Hoover and several other prominent Government officials to the members of the Institute at the building of the Bureau of Standards.

In reviewing the results of this latest meeting of the Institute, it is safe to say that no previous assembly of architects has dealt with more important measures, exhaustive reports and scholarly addresses, all of which should have a far reaching influence upon the future development and practice of the profession in this country. The feeling of mutual understanding and good fellowship which seemed to pervade the convention throughout its duration should tend to create better feeling, and to engender mutual respect and reciprocal appreciation among the members of a profession in which the lack of these qualities is too often painfully evident.

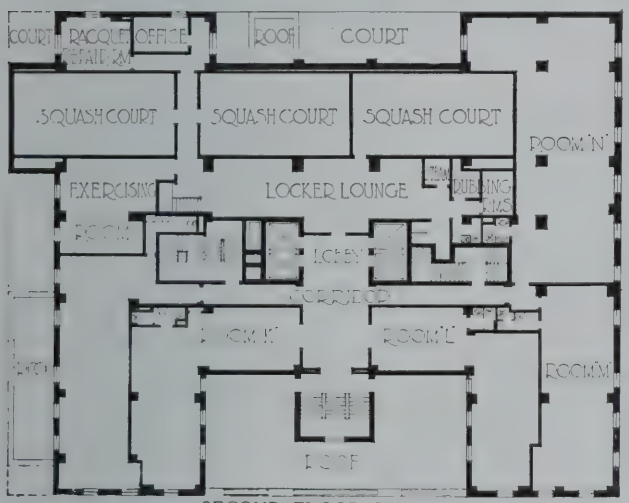
It would seem that the splendid spirit, the undoubted success and the invaluable inspiration achieved by this convention of the American Institute of Architects should give an affirmative answer to the question, asked by retiring President Faville at the close of his opening address: "Is the Institute furnishing to the architectural profession as a whole, the highest form of leadership?" Surely no finer leadership in a great profession, combining as it does, artistic genius with business ability, could be desired than the high minded, distinguished leadership which the Institute has again demonstrated that it has the ability to assume. The future holds untold opportunity for the further beneficent influence of such leadership and service, not only upon the profession, but also upon the public, through developing a greater general appreciation and understanding of architecture.

Toward this much desired end the joint exhibition to be held in New York next April by the American Institute of Architects and the Architectural League of New York should greatly contribute. During this exhibition of architecture and the allied arts, which will be nation-wide in its scope, the Institute plans to hold in New York its next annual convention, at which time it is not doubted that it will again and even more forcibly demonstrate its high position as the leading and guiding spirit in American architecture.

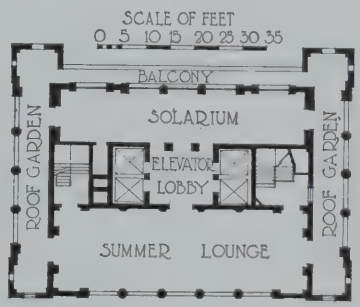
THE FRATERNITY CLUBS BUILDING, NEW YORK
MURGATROYD & OGDEN, ARCHITECTS

Photos. John Wallace Gillies

CROWNING CORNER TOWERS AND CENTER PAVILION WITH LOGGIAS

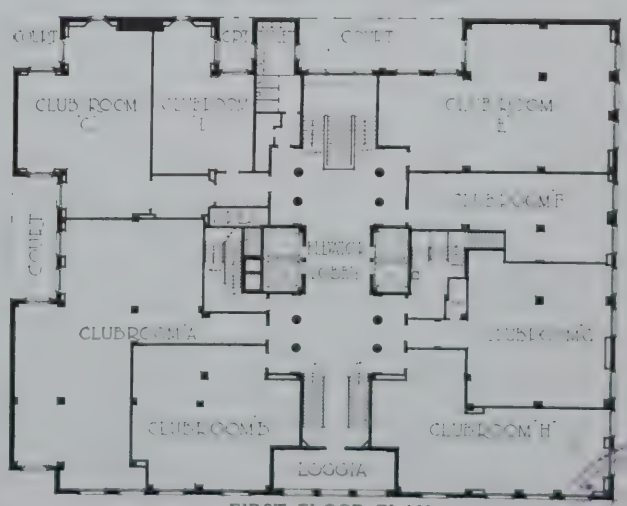


SECOND FLOOR PLAN



SIXTEENTH FLOOR PLAN

ENTRANCE FLOOR PLAN



FIRST FLOOR PLAN

THE FRATERNITY CLUBS BUILDING, NEW YORK

MURGATROYD & OGDEN, ARCHITECTS

ROOF GARDEN ARCADE

SUMMER LOUNGE

THE FRATERNITY CLUBS BUILDING, NEW YORK
MURGATROYD & OGDEN, ARCHITECTS

MAIN STAIRCASE

ENTRANCE LOBBY

THE FRATERNITY CLUBS BUILDING, NEW YORK
MURGATROYD & OGDEN, ARCHITECTS

ELEVATOR LOBBY, FIRST FLOOR

SOLARIUM

THE FRATERNITY CLUBS BUILDING, NEW YORK

MURGATROYD & OGDEN, ARCHITECTS

FIREPLACE IN SOUTHEAST DINING ROOM

ENTRANCE TO SOUTHEAST DINING ROOM

THE FRATERNITY CLUBS BUILDING, NEW YORK
MURGATROYD & OGDEN, ARCHITECTS

A FRATERNITY CLUB LIVING ROOM

ONE OF THE FIRST FLOOR CLUB ROOMS

THE FRATERNITY CLUBS BUILDING, NEW YORK

MURGATROYD & OGDEN, ARCHITECTS

SOUTHEAST DINING ROOM

SOUTHWEST DINING ROOM

THE FRATERNITY CLUBS BUILDING, NEW YORK

MURGATROYD & OGDEN, ARCHITECTS

APPROACH TO CONCRETE STADIUM

DUTCH COLONIAL INFLUENCE SHOWN IN THE BUILDING FOR SOUTH AFRICA
BRITISH EMPIRE EXHIBITION

Photos. Campbell Gray, Ltd.

CURTAINED STAGE FOR THE DISPLAY OF COSTUMED MANIKINS

LA GRANDE SALLE DE LA COUTURE

THE FRENCH EXPOSITION, GRAND CENTRAL PALACE, NEW YORK

HOWARD GREENLEY, ARCHITECT

Photos. John Wallace Gillies

BOSTON PUBLIC LIBRARY

ORNAMENTAL URNS TO EMPHASIZE THE ENTRANCES

CORRIDOR SHOWING TEMPORARY ARCHITECTURAL TREATMENT

THE FRENCH EXPOSITION, GRAND CENTRAL PALACE, NEW YORK

HOWARD GREENLEY, ARCHITECT

CORRIDOR SHOWING VINE COVERED LATTICE VAULTING

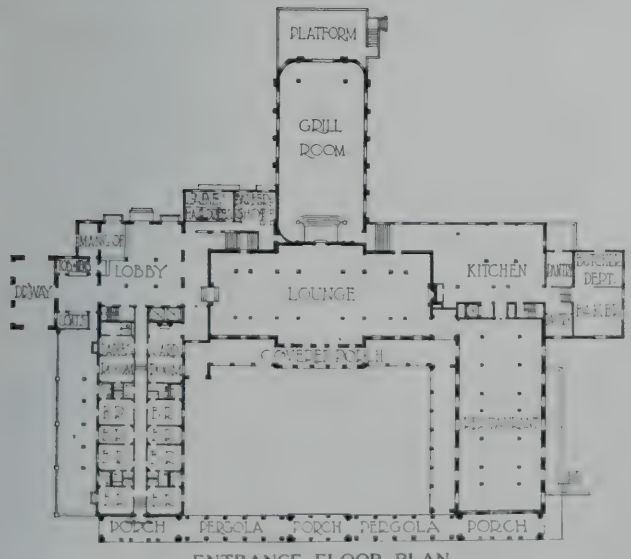
TEMPORARY ARCHES COMBINED WITH PERMANENT PIERS

THE FRENCH EXPOSITION, GRAND CENTRAL PALACE, NEW YORK

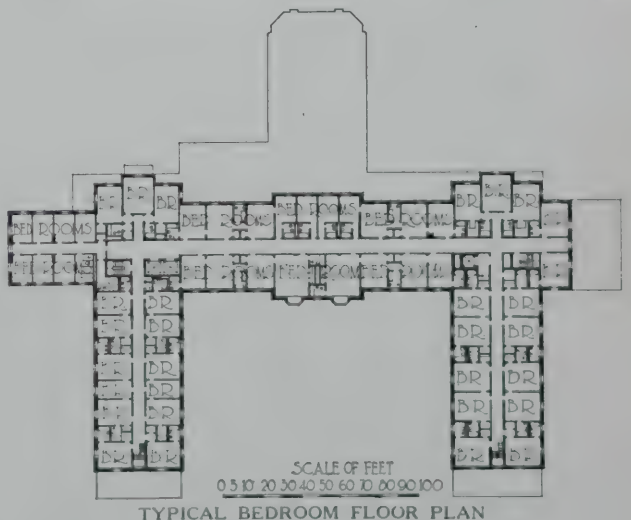
HOWARD GREENLEY, ARCHITECT

LIBRARY

PERGOLAS AND PORCHES ON THE SOUTH TERRACE



ENTRANCE FLOOR PLAN



TYPICAL BEDROOM FLOOR PLAN

HOTEL ROYAL BERMUDIANA, HAMILTON, BERMUDA

WARREN & WETMORE, ARCHITECTS

"PLAN OF ENTRANCE DRIVE PRESERVED EXISTING TREES"

"SEMI-TROPICAL PLANTING WAS LEFT UNDISTURBED"

HOTEL ROYAL BERMUDIANA, HAMILTON, BERMUDA

WARREN & WETMORE, ARCHITECTS

Photos: Drix Duryea

ENGLISH BAR IN THE BASEMENT

FIREPLACE GROUP AT END OF LOUNGE

HOTEL ROYAL BERMUDIANA, HAMILTON, BERMUDA

WARREN & WETMORE, ARCHITECTS

GRILL ROOM

RESTAURANT

HOTEL ROYAL BERMUDIANA, HAMILTON, BERMUDA

WARREN & WETMORE, ARCHITECTS

SERVICE SECTION
of THE ARCHITECTURAL FORUM

Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

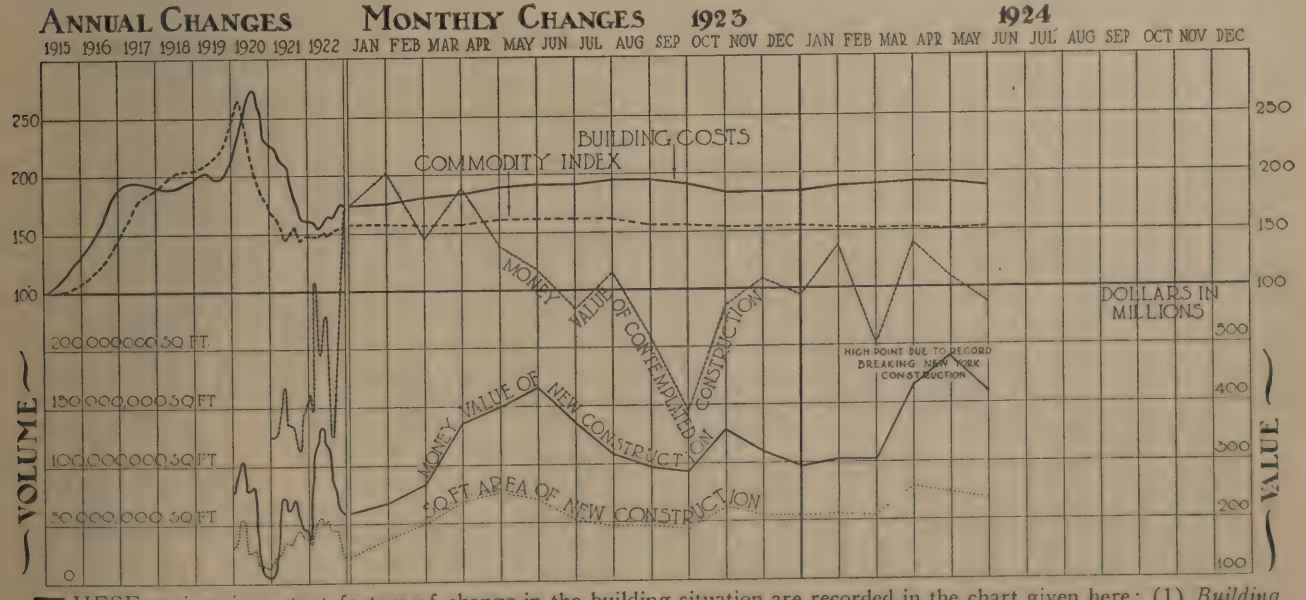
The Building Situation

DURING the first five months of this year the total value of new building construction as indicated by contracts let throughout the country has reached the unprecedented figure of over two billion dollars. The record-breaking phases of this activity have been largely confined to the Eastern district, which includes metropolitan New York, and may be attributed primarily to a vast volume of speculative building. The figures for May which, according to the F. W. Dodge Company, are 13 per cent below those of May, 1923, indicate the swelling up of this unusual activity, but it is interesting to note that substantial increases over last month are shown in New England, the Northwest, and the Southeastern states.

There are in fact several definite symptoms of a radical change in the building situation which would seem to predict a trend away from speculative building and toward institutional, investment and similar types. It is quite probable that there will be a slowing up in the residential building field, because it is evident that in many of the more congested areas the housing demand is fairly well satisfied. A number of architects report a reduction of interest on the part of speculating builders and an increase of interest on the part of clients interested in the construction of institutional buildings, large private residences, office buildings and other structures for direct utility purposes. It may be said, in other words, that we are again reaching the end of the highly speculative cycle and approaching the more conservative market which usually follows.

The figures for May substantiate these statements because they indicate a sharp reduction in residential and industrial activity and a definite increase of interest in the letting of contracts for commercial, educational, religious and hospital buildings. It is quite probable that following a natural reduction of activity during the summer months there will be a sharp increase in the volume of new buildings indicated by contracts let in the fall.

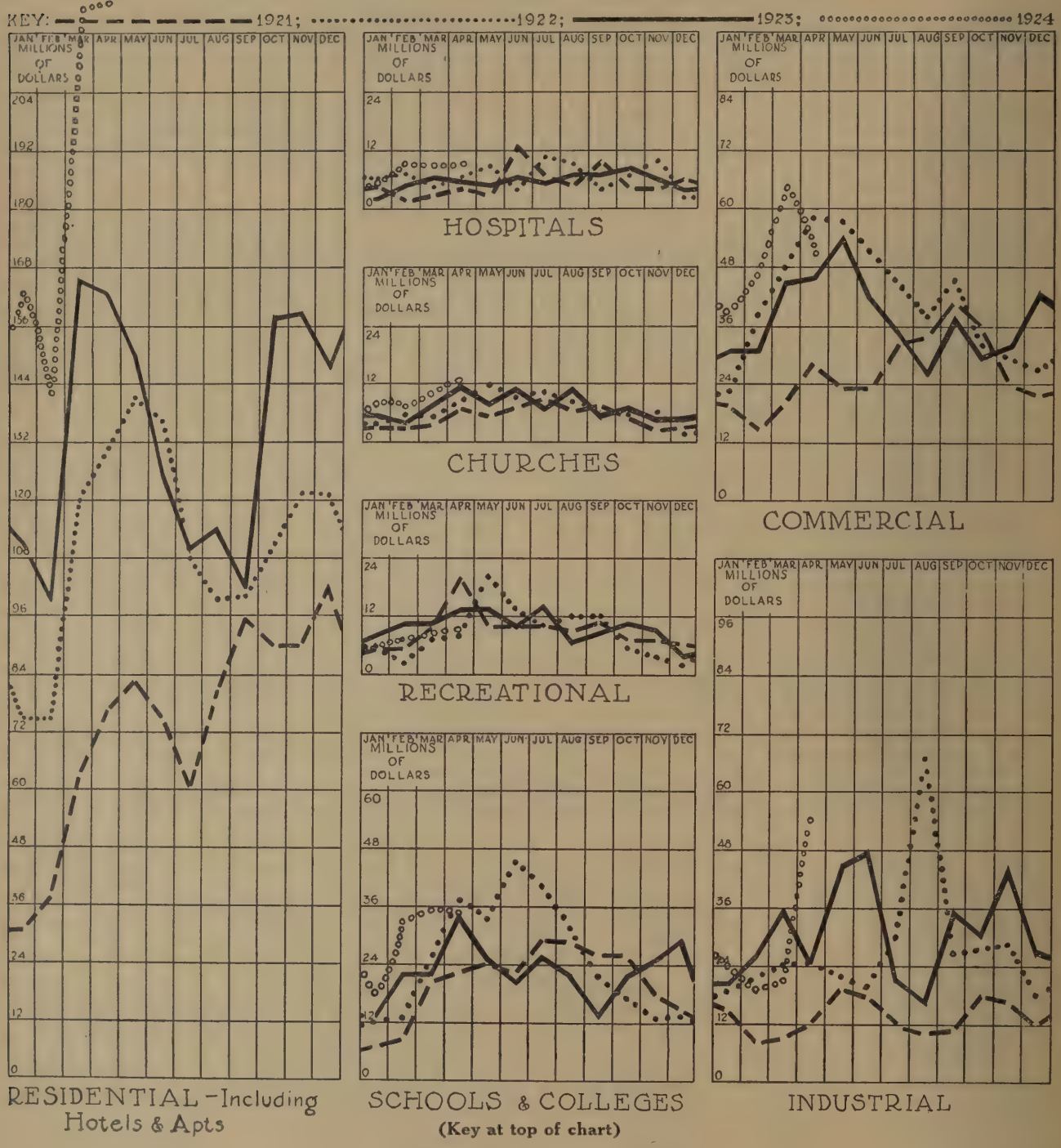
Mortgage money is still plentiful, and there seems to be no decrease of confidence or interest in this class of investment, except that the large loaning interests are in many sections deliberately discouraging certain forms of frankly speculative building.



THESE various important factors of change in the building situation are recorded in the chart given here: (1) *Building Costs.* This includes the cost of labor and materials; the index point is a composite of all available reports in basic materials and labor costs under national averages. (2) *Commodity Index.* Index figure determined by the United States Department of Labor. (3) *Money Value of Contemplated Construction.* Value of building for which plans have been filed based on reports of the United States Chamber of Commerce, F. W. Dodge Co., and *Engineering News-Record.* (4) *Money Value of New Construction.* Total valuation of all contracts actually let. The dollar scale is at the right of the chart in millions. (5) *Square Foot Area of New Construction.* The measured volume of new buildings. The square foot measure is at the left of the chart. The variation of distances between the value and volume lines represents a square foot cost which is determined first, by the trend of building costs, and second, by the quality of construction.

Monthly Analysis of the Trend of Building Activity

A study of the value of contracts let each month in seven important types of buildings—with graphic comparisons for the three preceding years



(Key at top of chart)

APRIL 1924 CONTRACTS

IN order that a comparison of monthly activity may be made at a glance, the value of contracts let is presented in the above graphic charts. This information is based on data obtained through the United States Chamber of Commerce and the F. W. Dodge Corporation. The activity of each year is shown by a special line according to the key indicated at the top of the page. Thus, on each chart the activity in the form of Money Value of Contracts Let may be followed through from January, 1921, to the most recent month for which figures were available when this page was printed. Not only is a rapid comparison provided of the total activity each year, but the relative activity for each month can be estimated by referring to the index figures representing millions of dollars as shown at the left of each chart. Reports cover about three-quarters of the total building in the United States.

BUILDING MATERIAL PRICES

Table Showing Average Prices Paid by Contractors for Building Materials at Local Distributing Points as of May 1, 1924. Prepared by Division of Building and Housing of the Bureau of Standards from Prices Secured through the Bureau of Census

Commodities	Size or Condition	Unit	Fitchburg	Haverhill	New London	Pittsburgh	Erie	Scranton	Baltimore	Washington	Richmond	Fairmont	Columbia	Savannah	Detroit	Saginaw	Bay City	Shreveport	Grand Forks	Sioux Falls
Common Brick		1,000	24.00	27.00	27.00	17.00	16.75	26.00	20.00	....	17.00	24.00	12.00	14.00	17.50	14.50	18.00	16.00	13.50	18.00
Portland Cement	Excl. of containers	Bbl.	3.25	3.50	3.43	3.10	3.40	3.00	3.00	2.80	3.20	2.75	3.50	2.95	3.40	2.75	2.65	3.20	3.80	3.00
Yellow Pine No. 1	Dimension 2x4-16' S1S1E	M	....	....	....	54.00	52.00	....	37.50	....	32.00	....	....	30.00	43.00	53.00	45.00	42.00	....	....
Douglas Fir No. 1	Dimension 2x4-16' S1S1E	M	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	52.00	47.00
No. Carolina Pine No. 1	Dimension 2x4-16' S1S1E	M	....	....	....	....	52.00	....	....	....	32.00	52.00	25.00	....	43.00	....	....	....	....	....
Common Boards No. 1	1x6	M	55.00	48.00	45.00	52.00	50.00	....	37.50	....	35.00	50.00	27.00	30.00	43.00	....	42.00	57.00	45.00	47.00
Y.P. Flooring Edge Grain "C"	1x4-10'-16'	M	110.00	128.00	110.00	....	....	....	130.00	....	110.00	100.00	95.00	....	....	100.00	....	108.00	....	....
Douglas Fir V. G. No. 2	1x4-10'-16'	M	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	95.00	85.00
Red Cedar Shingles	Extra clear 16" 5 to 2	100 sq. ft.	6.95	6.20	6.00	6.50	6.50	....	11.20	....	6.20	7.25	....	....	5.50	6.50	6.50	7.75	6.00	5.25
Cypress Shingles	Extra clear 16" 5 to 2	100 sq. ft.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	8.00	....	....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	....	....	....	6.75	6.50	....	....	5.75	5.48	6.75	7.00	....	6.00	6.00	6.25	....	9.00	7.50
Gypsum Plaster Board	⅜"	1,000 sq. ft.	....	45.00	50.00	37.50	45.00	32.50	....	32.50	....	40.00	35.00	50.00	30.00	45.00	41.00	45.00	....	32.00
Lime	Hyd.	Ton	25.00	20.00	26.00	24.00	22.00	22.00	....	....	19.50	16.00	20.00	17.50	20.00	16.00	18.00	25.00	28.00	24.00
Building Sand		Cu. yd.	1.80	2.50	1.65	2.50	3.50	....	1.70	....	1.89	3.70	1.25	1.50	2.75	2.75	2.25	2.25	....	1.20
Crushed Stone	¼"	Ton	3.25	2.50	....	5.50	3.50	....	....	....	2.35	2.75	2.75	3.25	2.35	4.50	3.50	3.20	....	2.70
Wire Nails		Keg	4.05	4.50	4.75	3.50	....	....	3.68	....	3.75	3.90	4.25	3.90	3.75	3.80	3.90	4.25	5.50	5.00
Window Glass	Single A 10"x12"	50 sq. ft.	4.50	....	4.27	5.95	....	....	3.90	....	5.80	4.40	....	....	4.50	4.75	4.50	5.10	....	5.40
Hollow Tile	8"x12"x12"	Each	.30	.30	.32	.20	.21	.25	.20	....	....	.24	.17	.15	.20	.21	.17	.22	....	.19
Cast Iron Soil Pipe	4" E.H. 13 lbs. per ft.	Ton	....	....	....	60.00	....	....	60.00	....	....	88.00	....	....	....	85.00	83.00	....	92.40	....
Steel Pipe	1" galv.	100 ft.	....	....	....	9.86	....	....	9.39	....	10.00	10.50	11.87	9.16	....	10.00	10.25	11.95	....	....
Reinforcement Bars	¾" square	100 lbs.	4.25	....	....	3.43	....	....	3.45	....	3.50	3.50	4.60	5.00	3.50	3.50	3.60	4.00	5.40	....
Structural Steel	Fab. 6" I beams	100 lbs.	6.00	....	....	3.25	....	....	4.00	....	4.00	5.00	4.85	5.00	6.00	4.90	4.75	6.50	5.40	....
White Lead	Dry	100 lbs.	....	13.50	14.50	14.50	....	....	15.00	....	....	12.50	15.75	15.50	....	14.00	14.25	15.50	17.00	15.25
Zinc Oxide	Am. process lead free	100 lbs.	....	....	....	15.00	....	....	....	....	15.00	....	....	15.00	....	....	14.75	....	....	....
Gypsum Plaster	Neat	Ton	24.00	....	26.00	22.00	24.00	21.00	19.00	20.00	....	19.00	19.00	....	21.00	20.00	16.50	24.00	23.00	14.50
Linseed Oil	Raw in bbls.	Gal.	....	1.05	1.35	.98	....	....	.97	....	....	.98	1.10	1.02	....	1.10	1.10	1.55	1.75	1.05
Roofing Slate	No. 1 ribbon	100 sq. ft.	....	....	....	14.25	....	....	....	....	....	13.00	....	....	....	17.50	17.50	12.00	....	....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	....	2.75	....	....	....	2.20	....	....	....	....	....	....	2.25	2.75	2.75	2.75	3.25	3.75
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	....	1.60	....	1.45	1.50	....	....	....	....	1.65	....	1.00	....	....	1.30	1.40	2.00	1.50

Commodities	Size or Condition	Unit	Poughkeepsie	Syracuse	Rochester	Buffalo	Cleveland	Akron	Lorain	Columbus	Jacksonville	Waterloo	Council Bluffs	Spokane	Seattle	Portland, Oregon	Milwaukee	San Antonio	Tucson	Los Angeles
Common Brick		1,000	20.00	20.00	18.75	23.00	16.00	16.00	22.00	17.00	18.00	16.50	16.50	....	15.50	18.00	13.00	17.50	15.00	15.50
Portland Cement	Excl. of containers	Bbl.	2.70	3.30	3.35	3.03	3.40	3.20	3.40	3.20	3.60	2.90	2.70	....	3.40	3.25	2.65	4.00	3.90	3.08
Yellow Pine No. 1	Dimension 2x4-16' S1S1E	M	....	60.00	48.00	55.00	59.00	45.00	55.00	47.50	40.00	52.00	47.00	....	....	....	42.00	55.00	....	....
Douglas Fir No. 1	Dimension 2x4-16' S1S1E	M	48.00	....	56.00	60.00	....	....	....	....	....	52.00	45.00	27.00	22.00	24.50	....	....	60.00	37.50
No. Carolina Pine No. 1	Dimension 2x4-16' S1S1E	M	48.00	42.00	48.00	....	....	....	....	47.50	....	....	....	....	....	....	....	....	....	....
Common Boards No. 1	1x6	M	40.00	39.00	45.00	50.00	49.00	45.00	50.00	....	60.00	47.00	45.00	26.00	23.00	24.50	42.00	55.00	55.00	36.00
Y.P. Flooring Edge Grain "C"	1x4-10'-16'	M	130.00	105.00	115.00	85.00	92.00	85.00	105.00	110.00	....	98.00	120.00	....	....	....	....	105.00	....	....
Douglas Fir V. G. No. 2	1x4-10'-16'	M	....	90.00	....	115.00	....	95.00	....	96.00	....	98.00	100.00	75.00	62.50	58.00	....	....	90.00	72.75
Red Cedar Shingles	Extra clear 16" 5 to 2	100 sq. ft.	....	6.25	6.00	6.75	....	6.00	6.00	6.00	....	6.50	6.25	....	....	....	6.00	....	5.00	....
Cypress Shingles	Extra clear 16" 5 to 2	100 sq. ft.	....	....	....	....	....	....	....	....	7.20	....	....	....	....	....	....	7.50	....	....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	....	6.00	....	....	6.75	6.00	....	6.50	6.25	6.50	....	....	....	....	....	9.00	....	....
Gypsum Plaster Board	⅜"	1,000 sq. ft.	50.00	32.50	30.00	45.00	....	26.00	....	....	45.00	36.00	....	....	35.00	40.00	40.00	47.50	40.00	35.00
Lime	Hyd.	Ton	26.00	20.00	20.00	16.00	20.00	20.00	17.00	16.00	22.50	20.00	18.00	....	24.00	26.00	18.00	20.00	20.00	26.00
Building Sand		Cu. yd.	2.25	1.80	2.75	1.48	2.50	2.00	2.50	....	3.50	1.75	3.50	....	1.85	2.00	1.75	2.25	1.25	1.75
Crushed Stone	¼"	Ton	2.40	2.25	2.85	1.35	3.50	3.00	2.65	3.50	6.00	3.00	4.00	....	....	....	2.67	2.50	3.50	3.10
Wire Nails		Keg	5.05	4.10	4.25	4.25	3.65	3.80	3.95	....	4.00	4.50	4.95	4.85	4.35	4.50	3.80	5.50	5.50	4.25
Window Glass	Single A 10"x12"	50 sq. ft.	....	4.50	4.20	4.20	5.50	4.50	....	4.50	4.16	5.25	....	....	3.55	5.50	....	....	....	4.38
Hollow Tile	8"x12"x12"	Each	.23	.25	.18	.20	....	.17	.19	.17	.19	.17	.14	....	.20	.20	.16	.20	.18	.20
Cast Iron Soil Pipe	4" E.H. 13 lbs. per ft.	Ton	....	80.00	....	63.05	....	78.50	....	....	....	82.00	....	103.00	95.00	113.00	....	129.36	112.50	83.80
Steel Pipe	1" galv.	100 ft.	....	10.51	10.52	10.51	....	10.36	....	10.47	11.80	12.00	....	12.15	11.85	....	10.00	11.12	11.75	11.30
Reinforcement Bars	¾" square	100 lbs.	4.50	4.00	3.50	2.75	....	3.90	4.35	3.50	3.00	3.80	3.10	4.15	4.00	4.00	3.60	4.00	....	4.25
Structural Steel	Fab. 6" I beams	100 lbs.	5.00	4.85	4.25	3.65	....	3.30	4.05	3.60	3.75	4.95	5.90	....	5.75	5.50	....	4.50	....	6.00
White Lead	Dry	100 lbs.	....	14.25	15.25	15.00	15.00	15.00	....	14.00	15.50	14.50	15.25	....	13.50	....	....	16.00	16.00	14.00
Zinc Oxide	Am. process lead free	100 lbs.	....	....	....	....	....	15.00	....	....	....	14.75	....	....	16.00	....	....	16.00	....	12.50
Gypsum Plaster	Neat	Ton	....	19.25	18.00	17.00	....	19.00	18.00	17.00	22.00	18.00	18.00	....	21.00	24.00	....	24.00	20.00	17.80
Linseed Oil	Raw in bbls.	Gal.	....	1.05	1.33	1.25	1.09	1.00	....	.98	1.00	1.15	1.26	....	1.08	1.25	....	1.05	1.20	1.08
Roofing Slate	No. 1 ribbon	100 sq. ft.	....	14.00	13.00	....	....	13.00	....	....	....	18.00	....	....	....	....	17.50	17.60	....	....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	....	2.25	2.75	2.00	2.50	2.70	....	2.75	2.50	2.85	....	2.82	....	....	2.45	3.50	3.25	3.50
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	....	1.50	1.35	1.35	1.00	....	....	1.60	1.15	1.40	1.35	1.29	1.50	1.80	1.15	1.80	1.50	1.40

THE FORUM CONSULTATION COMMITTEE

A group of nationally known experts on various technical subjects allied to building, providing a direct service to architects

THE editors of THE ARCHITECTURAL FORUM have been fortunate in obtaining the co-operation of the following recognized experts who constitute THE FORUM Consultation Committee. This Committee provides a service of the greatest value to subscribers in addition to the usual editorial service, and architects who seek information on specific questions in these various fields are invited to present inquiries.

The basis on which this Committee has been organized is:

(*a*) That each committee member shall be a representative leader in his line;
(*b*) That no committee member has affiliations with any manufacturer;
(*c*) That no committee member will be called upon for detailed service excepting by special arrangement;
(*d*) That a special editorial article on a subject represented under each of the headings below shall be prepared during the year by the committee member.

SUBJECTS AND COMMITTEE PERSONNEL

HOTEL DESIGN AND EQUIPMENT

DANIEL P. RITCHEY

Known in the hotel field as the "hotel doctor," Mr. Ritchey, who is an engineer as well as an experienced hotel owner and manager, is qualified to answer any questions which may arise in this connection.

HEATING AND VENTILATING

CHARLES A. FULLER

Consulting, Heating and Ventilating Engineer

Member of firm of Griggs & Myers, New York. Widely experienced in the field of heating and ventilating design for office buildings, institutions and industrials; specialist on investigation and report work on mechanical equipment for new and old plants.

ELECTRICAL SCIENCE

WILLIAM L. GOODWIN

Vice-president of the Society for Electrical Development

This Society is organized to promote accurate knowledge of the practical application of electricity. Its activities extend from the simple problems of household equipment to highly developed electrical plants. Particular attention is given the development of provision for electrical service in buildings.

SAFETY ENGINEERING

S. J. WILLIAMS

Secretary and Chief Engineer, National Safety Council, Chicago

Safety engineering is an important factor in the design of buildings where large groups of people congregate. The National Safety Council has investigated construction and devices with the greatest minuteness.

FARM SCIENCE

FREDERICK WALTER IVES, B.S., M.E.

Professor and head of Department of Agricultural Engineering, Ohio State University. Consulting Agricultural Engineer, Columbus, Ohio.

Specialist in land drainage, soil improvement, surveys, farm arrangement for economical production, purchase of equipment and economical layout of farm buildings with special reference to interior arrangement.

FINANCE

WALTER STABLER

Comptroller, Metropolitan Life Insurance Co.

The largest institution in the United States making loans for building construction. Mr. Stabler's knowledge of building investments covers the country and is widely recognized.

REAL ESTATE

C. STANLEY TAYLOR

Widely experienced in real estate development and financing, real property law, architecture, engineering and building construction. Financial and Business Editor of THE ARCHITECTURAL FORUM.

FIRE PROTECTION ENGINEERING

J. D. HUNTER

Chief Engineer, Marsh & McLennan, Insurance Brokers, New York

Specialist in insurance engineering as applied to building design, construction and equipment.

BUILDING MANAGEMENT

J. CLYDESDALE CUSHMAN

President, Cushman & Wakefield, Inc., Real Estate, New York

Mr. Cushman's firm has participated largely in the promotion and operation of many large New York buildings. His specialty is the management of office buildings.

GAS SERVICE AND UTILIZATION

NILS T. SELLMAN

Service Engineer, American Gas Association

A specialist in problems pertaining to gas service and its use in all classes of buildings and industries.

Address inquiries to committee members, care THE ARCHITECTURAL FORUM, 383 Madison Avenue, New York

THE FORUM DIGEST

A SURVEY OF IMPORTANT CURRENT ARTICLES ON BUILDING ECONOMICS AND BUSINESS CONDITIONS AFFECTING CONSTRUCTION

The Editors of this Department select from a wide range of publications matter of definite interest to Architects which would otherwise be available only through laborious effort

AMERICAN CONSTRUCTION COUNCIL

A Statement Issued Through Its President, Franklin D. Roosevelt

ONE year ago a general condition, characterized by nearly everyone's trying to build at once, existed throughout most of the country. The resulting congestion created a serious situation which caused the American Construction Council, in coöperation with other agencies, to sound a note of warning and suggest that speculative and unnecessary building be suspended until the supply of labor and materials could catch up. This view of the situation came to prevail throughout the country, and the volume of construction and the price levels did not rise to the breaking point.

As one of the results of this steadying of the industry, the Council was able, last fall and early winter, to urge all those desirous of building at that time to undertake such work so far as possible at an early date in order to benefit by the usual slackening of demand for materials and labor during the winter months. It was hoped in this way to avoid a possible building crisis in the spring of the present year. The large volume of construction contracted for and started during the fall and winter months shows that the public responded very favorably.

In reviewing the situation at the present time, the Council believes that there is no need for a warning such as existed last year. While general business has dropped off somewhat during the past three months, construction is one of the few great industries that has held up. Though there is a large volume of construction under way and projected, the great amount of winter work already done and present activities show greater stabilization than has often existed at this season of the year. This does not point to danger for the country as a whole, although in certain localities this may not hold true, particularly in the vicinity of New York.

It is the Council's recommendation at this time that investors and all others interested in construction watch developments closely, particularly for the next few months. If an artificial boom presents itself, great care must be exercised in regard to speculative and other unnecessary construction until the danger is passed. Winter building and especially the postponement of maintenance and repair work to the slack season, as repeatedly urged by the Council, will do much to help a situation of this kind and at the same time lengthen the working period, thus extending the active season without overlapping or congestion. If on the other hand there should be an early slackening or recession of work, proper measures should be taken to bring out those kinds of construction which otherwise should be deferred until the period of greatest activity is normally passed.

The future course of building construction costs is somewhat problematical. At present they are at a high level in spite of the mistaken attempt to decrease such costs by poor construction.

One very serious situation confronting the country requires special attention. A large percentage of present-day building construction throughout the country is distinctly inferior in quality and unsound in financing. Thousands of structures now under way or recently erected, especially in housing, are subject to such rapid deterioration that within ten years' time, sometimes less, they will be practically valueless. This rapid depreciation coupled with unsound methods of promotion must entail enormous loss on the principal investment, besides entailing serious expense and heavy additional burdens for repairs and maintenance after a few years. A still further burden is added by the higher rates of insurance due to the use of inferior materials and poor construction. All these make for higher rents.

This situation results from the activities of irresponsible groups, found in every element of the industry. Faulty engineering, unreliable architects, inexperienced and incompetent contractors, inferior grades of materials, poor mechanics, inadequate and poor inspection, and other bad factors too frequently enter into building work. These have serious effects, but no more serious than unsound financing. Mortgage bonds are issued and sold on speculative buildings. Many such issues are based on improper security and fictitious statements of earnings at abnormal interest rates. They find buyers because of the general ignorance existing in many quarters as to the requirements for good real estate securities. Such purchasers are usually those who can least afford to be victimized. Every element of the industry must bear its proportionate share of the blame for the vicious practices not infrequently found in building projects today, and for permitting within its jurisdiction practices that do not measure up to proper standards.

To further the interests of the business of building and a general adoption of the principles of better building the Council has appointed a special and fully representative committee of men vitally interested in the desirable ends to be gained. This committee will make a survey of conditions and recommend correctives where deemed necessary.

The Council's program for the training of apprentices and the development of improved craftsmanship in the building trades is calculated to benefit greatly this situation. Quality of workmanship and sufficient numbers of workers are very vital to high-grade construction. Training apprentices is a national question and cannot be solved merely by treatment in isolated spots without regard to the other sections of the country and national needs as such. The American Construction Council, as the national body representative of all elements in the construction industry and the public and coöperating with the various localities and branches of the industry, thus has in its apprenticeship work a most effective means for furthering the principle of better building in addition to other desirable ends to be gained through apprentice training.

The foregoing measures combined with the Council's help in reducing the seasonal variations in building operations with their bad effects on quality of construction, particularly during the rush periods of the year, and its assistance in the promotion of organizations in the different localities of the country by bringing together the various elements of the industry in these sections as a part of its national movement to promote responsibility and intelligent coöperation in all of their aspects, furnish the basis for securing very practical results to industry generally and to

the public which is chiefly concerned.

This statement was somewhat amplified a little later by Mr. Roosevelt who is quoted as saying:

"The danger of inflation, such as confronted us a year ago at this time is not to be feared at present. There is no denying the fact that business as a whole has received a setback, although the construction business has not suffered so far. It is unthinkable, however, that business generally can slump off for any protracted period without the construction industry's feeling the effect. The next three months should reveal just what is before us. Either there will be a turn for the better in business generally or else things will go on much along the present line. This will give the construction industry an opportunity to guide itself properly and set its house in order."

In the course of a discussion it was suggested by one of the men present that with the tendency as pointed out by Mr. Roosevelt, it would be the height of folly to keep on paying higher and higher wages to building labor. This led E. J. Russell, a St. Louis architect, to review a pact made in that city between the building industry and building labor last year, providing for the highest wages in the country, with labor agreeing not to unsettle conditions by asking for still higher wages. The material men, he said, had, however, advanced prices.

BUILDING INDUSTRY IN SOUND CONDITION, AUTHORITIES DECLARE

Despite Tendency Toward Over-Expansion in New York, Continued Large Volume for Nation Is Predicted

EXCEPT in New York the present indications do not point to any likelihood of over-expansion in the building industry. Thus is the situation summed up by the *Guaranty Survey*, published by the Guaranty Trust Company of New York, in which it is shown that building conditions are generally sound. "In spite of the high level of building activity which has been maintained for more than two years," says the *Survey*, "it is evident that an appreciable part of the shortage resulting from the relative inaction of the war period still remains; a dearth of structures for the country as a whole is still apparent."

In comparing the 1923 building figures with those of 1922 the *Survey* points out that "it is doubtful, in view of the higher costs represented and the amount of construction known to have been postponed or abandoned, whether the actual work undertaken was equal in volume to that of the preceding year (1922)."

Briefly, the Guaranty *Survey* brings out these points which are so fundamental as to be worthy of the serious thought of not only the building industry, but also the financial and business world:

(1) The 15 per cent increase reported in 36 states during the first quarter is more than accounted for by the figures for one city—New York, where speculative building on a large scale is causing real apprehension that a housing surplus may result — residential building being nearly three-quarters of the activity in prospect in New York.

(2) The remainder of the nation shows about 10 per cent decrease in physical volume, and present national conditions give promise of a well sustained rate of activity.

(3) Because of higher building costs it is doubtful if the spring building season will show an increase in physical volume enough larger to cover the usual seasonal increase.

(4) Rent levels affect the "housing shortage" through their influence on the "incentive to rent" and the "incentive to build."

(5) A decline in rents would decrease the incentive to build but would increase the incentive to rent —the one counteracting the other.

(6) The decline in building activity will probably be gradual, and a large volume of construction may be anticipated for some time to come.

In reviewing the Guaranty *Survey*, G. L. Miller, president of G. L. Miller & Company, said that "this *Survey* appears to present the most careful, keen and level-headed analysis of the building industry which has come to my attention. It points out that the housing shortage is not stable; it fluctuates according to rent levels, being defined as 'the excess of demand for housing space, at existing rent levels, over the amount of space available.' Nor can the housing shortage be properly expressed in terms of dollars, for the dollar itself fluctuates in purchasing power, and the costs of construction vary from time to time. It would seem to be much more accurate to use figures representing area in square feet of floor space or, in other words, physical volume.

"The Guaranty *Survey* makes a sharp distinction between conditions in New York and in the rest of the nation. This is refreshing, since it seems to be a most common mistake to base national conclusions on local New York conditions. Contrary to conditions prevailing in New York, building retrenchment is well under way in the south. Curtailment of building operations in the southern states is a national and healthy development after five years of activity, during which new construction records have been successively piled up. Unless the last six months of 1924 bring forth unexpectedly large totals of building, the south will probably show a 10 to 20 per cent decrease this year, as compared with 1923.

"Retrenchment of building operations in the south, and for that matter in several sections of the United States, means that real estate values and rentals are being placed upon an even more stable basis than in the past. Such retrenchment is a safeguard against possible over-building and does not mean that the need for new buildings has been satisfied. It merely means that at the present levels of building costs, and rentals, property owners and financing institutions have deemed it prudent to guard against any possible decline in demand. As the Guaranty *Survey* points out, should rents decline there would immediately be a fresh increase in demand for housing space, which would stabilize the building situation and operate to check a further decline. Thus we see that the building situation is in a continual state of flux and creates within itself the cures for the ills it sets up. Upon this principle we can erect a structure of confidence in building as the second largest industry in the country, and as one of the principal stabilizers and stimulators of business and trade prosperity.

"As one analyst recently pointed out, this means that 'unless stopped by some great national misfortune, the building industry will continue to maintain and promote American prosperity . . . as it has helped maintain and promote American prosperity in 1923 and 1922. A more encouraging sign of the times could hardly be imagined.'"

Further comment on the Guaranty *Survey* was made by Thomas S Holden, statistician of the F. W. Dodge Corporation, who says, "Our own analysis of the situation is in substantial agreement with the *Survey*. With the rather glaring exception of New York, the speculative element does not appear to be dominant in building operations generally. After a winter of unusually large activity and the usual seasonal increase this spring, there is now a gradual reaction in progress, which comes at just about the right time to check the recent boom from going beyond reasonable bounds. We note with particular interest the remarks in the article concerning the reaction of rent levels and construction costs on building demand. Should there be a sufficient slowing up of building activity to bring about decreases in either of these important factors, it is very likely that a new demand, now dormant, would assert itself. For this reason, building volume, aside from temporary fluctuations, ought to continue at a very good rate for a long time to come."

The New York Building Congress has recently issued an announcement that, unless there is a voluntary curtailment of building plans, it will

undertake an active campaign to induce moderation. This applies, of course, only to New York and is indicative of the close watch which is being kept on the situation here. It is not improbable that the great amount of expert analysis and sensible forecasting which is being done by the Building Congress and other organizations of similar nature will tend to supply the psychological check which may save the local situation from serious demoralization.

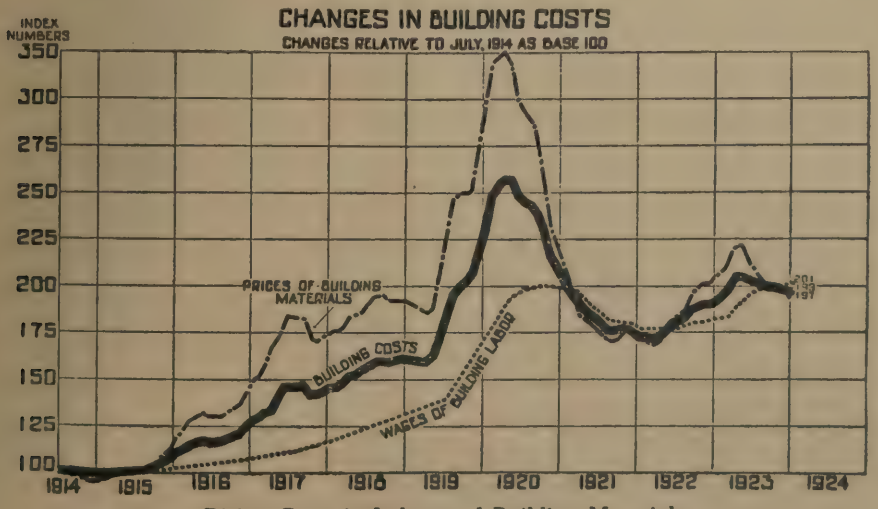
COST OF BUILDING DOUBLES IN LAST 10 YEARS; LABOR AND MATERIALS SHARE EQUALLY IN RISE

BUILDING costs in the United States, in the midst of what economists have agreed in the country's greatest construction boom, have doubled in the last ten years, according to an announcement issued by the National Industrial Conference Board. In its announcement the board summarized the results of a study into the national building situation, which shows that costs of labor and of materials stand at exactly the same increased levels for the first time since 1920. While in New York the building crafts receive high wages, last month they were the highest in the country in only 10 out of 25 trades. Graphic charts reveal the nation-wide character of rising costs, not alone in wages, but in all materials entering into building. Other cities reporting uniformly high wages are Chicago, Cleveland, Pittsburgh, St. Louis, and Houston, Texas.

The investigation covered the leading American cities, and took in all the crafts and the leading elements in building material. Wage figures were based on government and other reports annually in May from 1914 to 1920, and monthly since August of that year. Among the separate trades, plasterers and bricklayers receive the bulkiest pay envelopes in practically all cities. Bricklayers get $1.25 an hour in 50 cities, and plasterers in 44 cities, while in St. Louis the rate is $1.75 an hour. Lathers and masons get $1.50 an hour in Houston, Texas, the same rate being received by roofers and hoisting engineers in New York. Masons get $1.25 an hour or more in 28 cities, lathers in 12 cities, hoisting engineers in seven cities and roofers in four. Gasfitters and steamfitters in Houston, plumbers in Houston and Pittsburgh, ornamental iron workers in Cleveland, marble setters in Philadelphia and tile setters in Shreveport, La., all get $1.37½ an hour. In New York the trades best paid next to those cited are carpenters, cement finishers, painters, pipe coverers, sheet metal workers, and structural iron workers. These get $1.31¼ an hour. Although their wages are less, steamfitters' helpers and laborers get the highest wages in the country in New York. The hodcarrier, once figuring prominently as the butt of cartoon and caricature, now counts himself among the aristocracy of labor, according to the board's survey, for he earns up to $1.25 an hour, and the average earned by all hodcarriers is more than 90 cents an hour, in the cities surveyed. The same sustained high levels are also being enjoyed by plumbers, electricians, carpenters and sheet metal workers.

Prices of building materials until recently more than kept pace with the rise in wages, the announcement reveals. It shows that from 1915 to 1920 the prices of materials increased more than twice as much as wages. In 1921, however, they fell to approximately the same levels as wages, and during the past year the present 100 per cent increase over 1914 in both was established. Cast iron pipe is the most expensive commodity in construction, as compared with 1914 wholesale costs, showing an increase of 306 per cent. Other materials which have more than doubled in cost in the past ten years are Douglas fir, lime, white pine, white lead and turpentine. Sheet copper and copper wire show the least advances over 1914 of only 4 and 5 per cent. Pine flooring and structural steel show great reductions over the peak period.

The general trend of building costs, taken as a whole, shows a tendency downward for materials, and a rising tendency in wages. There was nothing adduced in the survey to indicate appreciable reductions in building costs in the near future, conditions as a whole being considered.



Rising Costs in Labor and Building Materials

REPORT ON PLUMBING

THESE pages have presented many notes on the progress of the movement toward simplification and standardization in building practice. The Department of Commerce Report on Recommended Minimum Requirements for Plumbing in Dwellings and Similar Buildings results from a widespread feeling that present state and municipal code requirements are in some respects unnecessarily restrictive and that conservation of labor and materials could be effected by scientific investigation of the burdens on such systems, and their performance under conditions of use. It is well known that the codes of different localities vary widely and that practices forbidden in some places are successfully employed elsewhere. The benefits of uniform requirements in permitting simplification of plumbing supplies are also generally recognized. The development of plumbing code requirements and practice in installation of plumbing systems have been almost entirely in the hands of master plumbers and journeymen. Architects and builders have been too likely to disregard the importance of this feature of building construction and it follows that no careful investigation has ever been made of the laws governing operation of plumbing systems. The report contains a recommended code and, in addition, a complete report of the experiments at the Bureau of Standards, showing how the committee arrived at its recommendations.

The results indicate that present customary assumptions in the design of plumbing are considerably on the side of safety and point the way to substantial economies in future work of this sort. The committee recommends that 3-inch soil stacks be permitted in systems for dwellings; that the running or house trap now required in many cities be omitted, and that a distance of not to exceed 5 feet be permitted between traps and ventilation pipes. As a result of tests with complete household systems it was found possible to eliminate much of the expensive vent piping now considered necessary. Economies possible through complete adoption of the committee's recommendations are estimated at from $50 to $100 for a 2-story dwelling with the usual number of fixtures, depending on the nature of requirements now obtaining in a given locality anywhere.

Consideration was given to the much discussed subject of plumbing code administration. The report states that while the relation of defective plumbing to disease is much less direct than formerly believed, the subject in all its branches is not yet fully explored, and the possibility of direct access of vermin from the interiors of plumbing systems to those of buildings is sufficiently objectionable to justify public regulation of plumbing work. The committee recommends a competent official plumbing inspector under jurisdiction of public safety authorities, to examine and approve plans and specifications, test and approve plumbing systems and take such other measures as will make his control of plumbing work effective. The advisability is suggested of substituting certificates of competency for the present licensing system and of permitting owners to install plumbing personally, provided this is done in accordance with the code and subject to official permit and inspection.

In addition to the recommended plumbing code an extensive report by the Bureau of Standards giving the procedure and results of experiments with plumbing systems carried on for over two years at that institution is contained which presents a considerable amount of data and discussion interpreting the results of experimental work and showing how the committee arrives at its recommendations for code revision. There are chapters on the lack of uniformity and agreement in present plumbing codes and on the desirability of simplification of plumbing supplies and fixtures. The report discusses the relation of plumbing to health and the considerations involved in licensing of plumbers, and plumbing inspection as a means of code enforcement. The appendices describe recent developments in theory of corrosion of metals, and investigations of the diffusion of gases in unventilated pipes.

The report contains 260 pages of text and 100 illustrations, mostly given in connection with the report of experiments at the Bureau of Standards. It may be obtained from the Superintendent of Documents, Washington, for 35 cents per copy. Remittances should be by currency or money order.

THE LOCATION OF LIGHT SOURCES

WHEN planning a lighting system, according to the *Electrical Record*, the importance of the proper location of outlets is frequently not given sufficient consideration. Too often the matter of shaving the cost is uppermost in mind, which sooner or later will result in an inadequate and generally unsatisfactory installation. It must be remembered that once the outlets are installed, the lighting units, sizes of lamps, etc., may be changed without great expense. However, if the room is to be used for any purpose which demands a change in the outlets merely because they are not sufficient in number or properly placed, considerable expense and annoyance may be experienced. Proper location of the outlets throughout a building when the lighting system is first installed will therefore economically provide for future needs, however remote the need may seem at the time when the lighting system is planned.

"The interiors of most buildings are divided into bays by columns or ceiling beams. Symmetrical location of the lighting units in each bay is a very convenient and desirable method of placing the outlets. Starting with the proper location of the units in one bay, the plan can be extended through the entire building. Should there be no structural divisions by either columns or beams, a plan can be laid out to scale and arbitrary divisions established.

"Outlets should not be spaced at a greater distance than 1½ times the mounting height from the floor. Thus if the unit is mounted 10 feet from the floor, the maximum distance between the units will be 15 feet. Spacing at a greater distance will result in spotty illumination. Furthermore, the angular direction of light will be such that annoying and even dangerous shadows may result. While a 15-foot spacing is permitted at a 10-foot mounting height, it should be remembered that better illumination will result from closer spacing. A rule-of-thumb method of spacing and mounting distances which will suit a large majority of cases is this: Mount the units 10 feet from the floor, space them 10 feet apart. Equip the units with 200-watt lamps and a level of illumination of approximately 10-foot candles will result. Where the proportions of the bays or rooms are such that 10-foot mounting height and 10-foot spacing distance will not be exactly suitable, a slight variation in either dimension will not materially affect the resulting illumination.

"Particular problems occasionally arise in which the commonly used method of spacing and mounting height will not be the best practice. In a room which is to be used for rough work, where a high level of illumination is not necessary, it might not be economical to provide the usual number of units per bay. Nevertheless, it may be desirable to arrange the units so that in case the room is to be used later for work requiring closer visual application and consequently more light, it can be secured without too great an expense.

"In a room having square bays measuring 20 feet on a side, the ordinary layman may deem one unit per bay sufficient. That would mean a spacing distance of 20 feet between units which would be permissible if the ceiling height were such that the units could be mounted at least 14 feet above the floor. The spacing distance would not exceed 1½ times the mounting height. However, it is always recommended that more than one unit per bay be installed in areas of this size so that light will reach the work from a sufficient number of directions to insure freedom from bad shadows, which might exist otherwise.

Locating Outlets

"In one particular instance the ceiling height is 13 feet which is too low for a mounting height which will permit 20-foot spacing. The rule-of-thumb method will readily apply in this case, 10-foot mounting height and 10-foot spacing distance which will provide four units in each bay. If, however, four units per bay are not deemed necessary, the placing of two units per bay will provide fairly satisfactory illumination. This arrangement will allow for future installation of two additional units per bay to provide more illumination for more exacting work. Should it be found necessary to divide up the room into smaller rooms, each individual room will be fairly well lighted without change in the lighting system. If there are benches along the outside walls extra units may be installed between those units comprising the outside rows to provide a higher level of illumination on these benches.

"In a building where the bays are rectangular instead of square, a different arrangement of units will be required. In another instance the bays are 16 x 20 and the ceiling height is 11½ feet. Here again one unit per bay will not provide uniform illumination on account of the low mounting height occasioned by the height of the ceiling. Four units per bay spaced 8 x 10 feet apart would provide the most desirable illumination and should be recommended wherever possible.

"In buildings where this layout is employed, there will be only two units in the bay nearest the wall when the bays across the end of the room are even in number. The distance from the units to the wall will be 8 feet and if there are benches along that wall, additional lighting should be provided. Where the number of bays is odd, the bays at both outside walls will have four units which will provide adequate illumination for those working on the benches."

When it is remembered how much the excellence of lighting depends upon proper placing of outlets, it will be realized how important it is that care be given to their part in a lighting system.

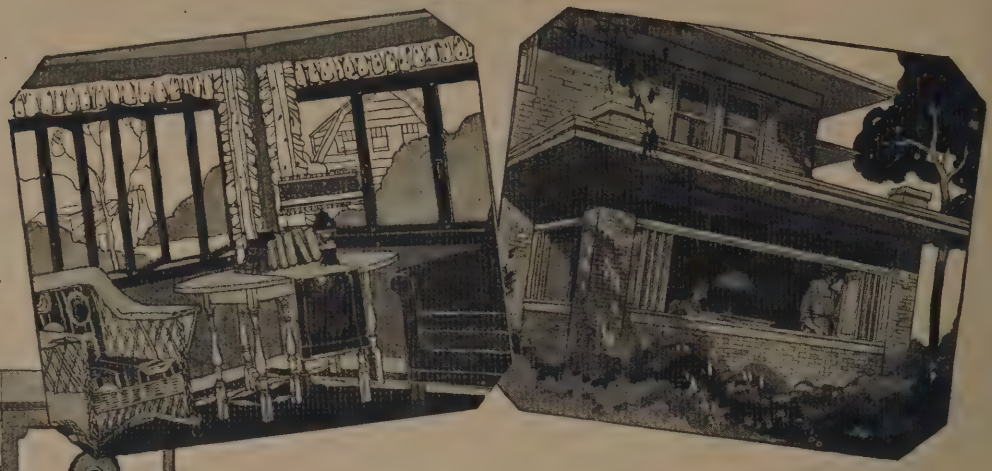
F. C.

Rec'd
AUG
7
19
B. P. L.

THE ARCHITECTURAL FORUM

AUGUST
1924

QVALITY LEAVES ITS IMPRINT



Living Rooms

AiR-Way equipped living rooms may be thrown wide open to the cooling breeze whenever the thermometer begins to climb.

Sun Rooms

Plenty of fresh air or absolute protection against the weather combine to make *AiR-Way* the most perfect enclosure for sun rooms and sleeping porches.

Bed Rooms

The *AiR-Way* equipped bedroom is a warm, sunshiny nook by day and an airy sleeping porch at night.

More Light—More Air—
for every room in the house

"In the support of life and the preservation of health," says Chicago's Commissioner of Health, "the importance of sunshine and fresh. air cannot be overestimated." Because it floods the entire home with sunshine and fresh air, *AiR-Way Multifold Window Hardware* has been endorsed by health authorities, architects, builders and home owners from sea to sea.

Dining Rooms

AiR-Way equipped dining rooms afford all the comfort of outdoor dining while retaining the conveniences of the indoor dining room.

AIR-WAY TRADE MARK

Kitchens

AiR-Way equipped windows enable the housewife to quickly convert her hot, stuffy kitchen into a pleasant, breezy porch.

AiR-Way equipped windows slide and fold inside, leaving an unobstructed opening the full width and depth of the frame. They open at a touch, without interference from either screens or draperies, and are absolutely weather-tight and rattle-proof when closed. *AiR-Way* windows may be partially opened, for ventilation, at any point desired.

Write today for Catalog F-4, which explains how easily *AiR-Way* windows can be installed in new homes or used to replace old-fashioned double-hung windows. Most hardware and lumber dealers sell this newest and best of window hardware.

Also makers of "Slidetite"—the original sliding-folding garage door hardware

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(220)

THE ARCHITECTURAL FORUM

VOLUME XLI · NUMBER 2

CONTENTS for AUGUST 1924

PLATE ILLUSTRATIONS	Architect	Plate
HOUSES OF MRS. W. K. VANDERBILT AND MISS ANNE MORGAN, NEW YORK	*Mott B. Schmidt*	17-24
HOUSES OF DR. W. S. KINGSLEY AND ADDISON MIZNER, PALM BEACH	*Addison Mizner*	25-28
ST. PAUL'S CHURCH, NEWBURYPORT, MASS.	*Perry, Shaw & Hepburn; Office of R. Clipston Sturgis, Consulting Architect*	29, 30
THIRD DISTRICT COURT, NEW YORK	*Alfred Hopkins*	31, 32

LETTERPRESS	Author	Page
COVER, OLD STATE HOUSE, BOSTON	*Louis C. Rosenberg*	
THE EDITOR'S FORUM		39
HOUSE OF PALLADIO, VICENZA	*From Sketch by Louis C. Rosenberg*	Frontispiece
NOTES ON PLANNING OF GROUNDS AND BUILDINGS	*George Howe*	45
TWO NOTABLE HOUSES ON SUTTON PLACE		49
THE EVOLUTION AND DEVELOPMENT OF JACKSON HEIGHTS	Andrew J. Thomas, Architect	61
SMALLER CIVIL ARCHITECTURE OF ENGLAND II. Berkeley's Hospital, Worcester	*Roger Wearne Ramsdell and Harold Donaldson Eberlein*	67
SPANISH INFLUENCE AT PALM BEACH		73
USE OF COMPOSITE COLUMNS IN CONCRETE BUILDINGS	*Joseph W. Parker*	77
INTERIORS, CHATEAU DE MONTFERMEIL, PARIS	*C. Hamilton Preston*	81
PLATE DESCRIPTION		87
EDITORIAL COMMENT		88

Solving the Housing Problem

ALBERT J. MacDONALD, Editor
PARKER MORSE HOOPER; PAUL W. HAYES, Associate Editors

Published Monthly by
ROGERS AND MANSON COMPANY
383 Madison Avenue, New York

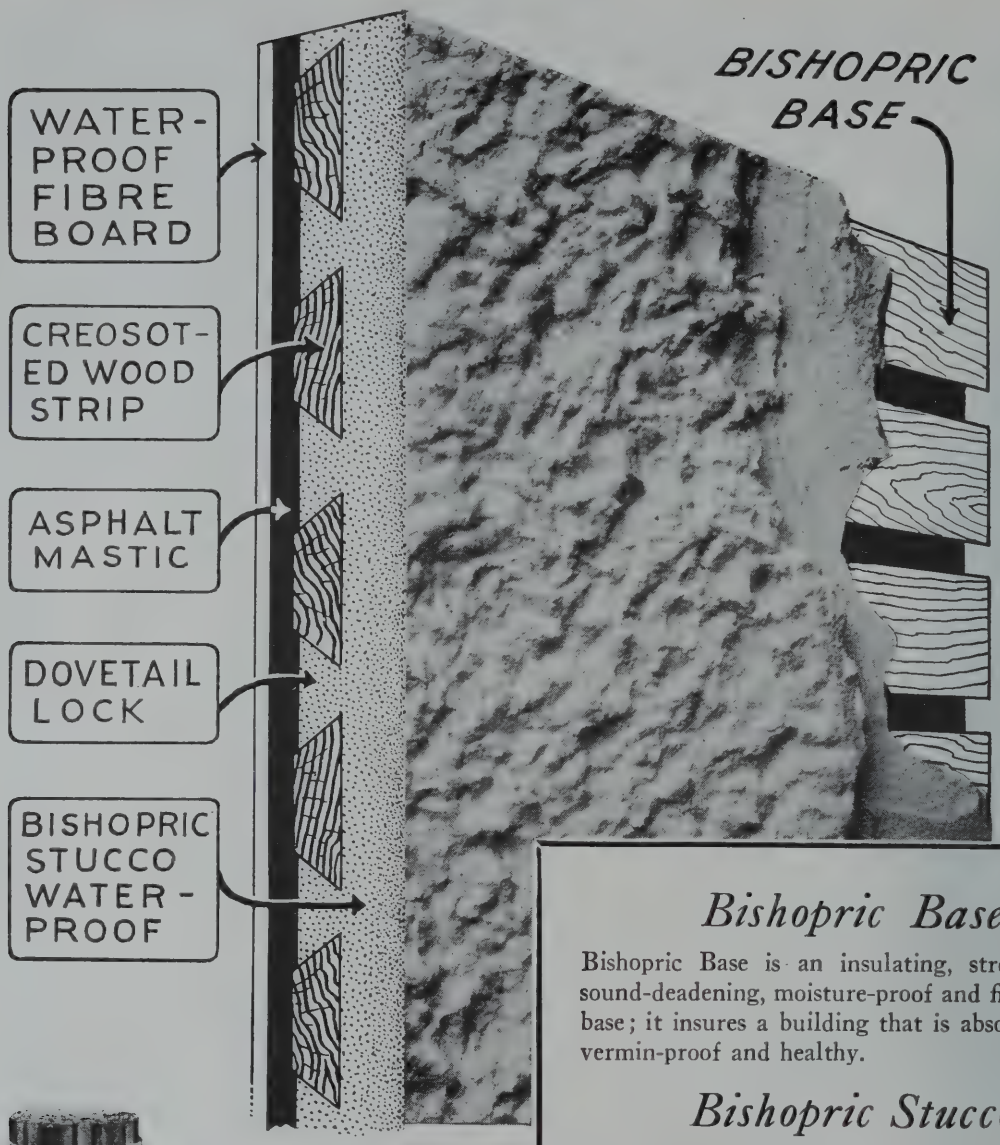
Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada.....$6.75 Foreign Countries in the Postal Union, 7.50
Single Copies.....60 cents All Copies Mailed Flat

Trade Supplied by American News Company. Entered as Second Class Matter at the Post Office, New York, N. Y., under the Act of March 3, 1879.

Copyright, 1924, by Rogers and Manson Company

Albert J. MacDonald, *President and Treasurer*
Robert Sweet, *Secretary*

Howard Myers, *Vice-president*
C. Stanley Taylor, *Vice-president*



The Roll and the Drum

Bishopric Base is shipped in rolls 100 square feet to the roll. It is easily handled, quickly cut to desired size and there is no waste.

Bishopric Stucco is packed in airtight metal drums preventing deterioration and loss, either in transit or storage, or on the job.

Bishopric Base

Bishopric Base is an insulating, strengthening, sound-deadening, moisture-proof and fire-resistant base; it insures a building that is absolutely dry, vermin-proof and healthy.

Bishopric Stucco

over Bishopric Base is water-proof and fire-proof. No contraction or expansion. All the elements of wear and tear have been anticipated in the manufacture of BISHOPRIC.

Booklet "Bishopric For All Time and Clime," beautifully illustrated, sent upon request.

Plan Book containing many attractive designs with floor plans will be sent upon receipt of 25c, coin or stamps.

Bishopric Is Sold by Dealers Everywhere.

The BISHOPRIC MANUFACTURING Co.
103 ESTE AVE. CINCINNATI, OHIO.
NEW YORK CITY CINCINNATI OTTAWA, CANADA

The BISHOPRIC MFG. CO. OF CALIFORNIA
LOS ANGELES

BISHOPRIC

Stucco Over Bishopric Base

BOSTON PUBLIC LIBRARY

PALLADIO'S HOUSE, VICENZA
FROM PENCIL DRAWING BY
LOUIS C. ROSENBERG

BOOK DEPARTMENT

Old English Walnut and Lacquer

DURING the progress of the English Renaissance, as one style of architecture came into vogue and triumphed for a time before being followed by another, the furniture was passing through similar stages of evolution, so that at any time the accessories which went into an interior were designed and built with a view to making the most of the interior's advantages, while the interior itself was designed to create an attractive setting for furnishings, the result being that rare harmony which many architects are striving to achieve today. The furniture during that long period was made of different woods; oak, for example, being plentiful in England, was in constant use up to the time of the Restoration, when the returning Stuarts set the fashion for the walnut to which they had been accustomed in France and Holland and which held its vogue until it in turn was supplanted by mahogany early during the Georgian era which followed.

Two-Chair Back Walnut Settee (1735)

Full-page Plate Illustration from "Old English Walnut and Lacquer Furniture"

This volume, by the author of the well known work "The Present State of Old English Furniture," is a review of the walnut period, dealing also with the lacquer which was fashionable for furniture at a time which was about that of the beginning of the walnut age. The period was one when England had been absorbing for a century or more the ideas in architecture and decoration which had reached the island from several European countries and which had been sorted, sifted, and generally assimilated into what pleased the English taste and suited the English temperament, and walnut with its fine, rich grain and smooth surface, and particularly with the ease with which it could be given a beautiful finish, was found to be well adapted to the needs of furniture makers. During the walnut age there were made many of the masterpieces of furniture which are in existence even yet, each year adding something to the mellow brown or gold of their patina.

The large scale of domestic interiors of this period led to a demand for pieces of furniture which were of vigorous sizes. A favorite piece was the "bureau-bookcase," and another was the "bureau-writing cabinet," either piece being a writing desk topped by a superstructure which frequently possessed pilasters and a fully developed entablature and some sort of a pediment, generally broken or scrolled. Another piece of furniture sufficiently massive and decorative to hold its own in rooms which were fairly large scaled was the chest of drawers mounted upon legs, this as well as the aforesaid "bureau" being of walnut which was richly figured, use sometimes being made of veneer to produce the effect of "matched" panels in drawer fronts or large surfaces, and often adorned with mounts of gilded metal or else with gilding applied directly to the wood. One more use for walnut was in affording a ground for marquetry of woods in different colors, an art in which the craftsmen of this age excelled, producing work of marvelous fineness and beauty, particularly in the tall clocks which have never been as beautiful as during the later Stuart period in England.

The vogue for lacquer acquired a firm foothold in England about 1660 and lasted for approximately 75 years. During the reign of Elizabeth products from the Orient were at least known, and both the Dutch and the English East India Companies were formed. France and Holland were also interested in the use of things Oriental, and on the accession of Charles II this craze spread to England where it was fostered by the court. Lacquer was at first used chiefly for "bureau-bookcases" and other bulky pieces, but later it was used upon furniture of all kinds and even on pieces of walnut, and later still the wainscoting of rooms was lacquered. So general became the use of lacquer that the process was successfully imitated by English workmen, their process being called "Japanning"; thus in time furniture of all kinds and even wainscots were being "Japanned."

As in his other works, Mr. Symonds writes with the point of view of collectors and connoisseurs in mind, and he gives considerable data which concerns the "quality" or the "state" of a piece, its general character, grain, patina, and the other points which determine its desirability. He dwells, too, as he always does, upon an exposure of the tricks and wiles practiced by those who would trade upon the gullibility of collectors by the manufacture and sale of bogus antiques—which, to be sure, are often nearly as beautiful as the genuine pieces. Few people object to the use of reproductions which are frankly sold as such, but often success in simulating age leads to palming off reproductions as real antiques.

OLD ENGLISH WALNUT AND LACQUER FURNITURE. By R. W. Symonds. 176 pp. Fully illustrated, 9 x 11 ins. Price $8.75. Robert M. McBride & Co., New York.

HISTORIC GARDENS OF VIRGINIA. Compiled by The James River Garden Club. Edited by Edith Tunis Sale. 355 pp., 7¼ x 9¼ ins. Price $10. The William Byrd Press, Richmond, Va.

EARLY settlers in Virginia carved from virgin forest a land which as nearly as possible was a miniature England. Named in honor of a virgin queen, Virginia was not settled by the lowly of the earth. Scions of old families, each with its pride of birth and coat of arms, preëmpted the waterfronts of the James and the Potomac, and presently there began to assume form the old country houses which still survive the vicissitudes of centuries. Now to make a garden is in the English blood, and there was no old house along the James which did not possess its garden, laid out in the formal and precise manner of the seventeenth century, or the eighteenth, its gay parterres edged about with box borders or hedges, and with a riot of color supplied by many of the plants which had flourished in English gardens together with some native to America. It is not difficult to picture these old gardens at the height of their splendor when the Virginian ladies and gentlemen in their silks and laces strolled up and down their shaded lanes or alleys.

Into this beautiful volume there are gathered illustrations, plans and descriptions of many of the gardens which form parts of these historic estates. Compiled by members of a Garden Club, each of these old plantation or country houses has been dealt with by someone particularly well fitted to write regarding it. Being a work on gardens, the volume is essentially a garden book, but so intimately is a garden related to its surroundings that views, plans and descriptions of the gardens include also those of the houses to which they belong, and in this day when gardens and gardening are regarded with new interest by owners of countless country places large or small all over the land, this volume on the fine old gardens of Virginia will aid in the planning and building of new gardens, which perhaps is one of the aims of its authors. In addition to being written in a vein which is highly attractive, the volume is produced in excellent form and distinguished by many illustrations in color of gardens which are notable.

MASTERS OF ARCHITECTURE. A Series of Monographs, Issued Under the General Editorship of Stanley C. Ramsey. Inigo Jones, by Stanley C. Ramsey; Sir John Vanbrugh, by Christian Barman; Nicholas Hawksmoor, by H. S. Goodhart-Rendel: Sir William Chambers, by A. Trystan Edwards. Each containing about 28 pages of text and 34 half-tone plates 7½ x 10 ins. Price $2.50. Charles Scribner's Sons.

IN the building up of an architect's library attention must be paid to a number of different departments. Design, construction, ornament, furniture and interior decoration, and the history of architecture are all important, and so too is the field of biography, the history of individual architects or perhaps of architectural firms, which naturally involves some study of their work and their influence both as individuals and as architects upon their times. The field of biography has perhaps been neglected in behalf of other kinds of architectural publishing which have seemed to have more immediate interest or more direct appeal, but there are both interest and importance in whatever aids in securing that "background" which is so important to the proper appreciation of architecture to both the layman and the architect.

The profession, in its present sense, is of no great age, for during many centuries knowledge of architecture was part of the equipment of a master builder—or perhaps, differently put, master building was one of the functions of an architect. At any rate, the names of but few great architects have survived up to the time of say Inigo Jones, and we search almost in vain for the names of the architects of the Gothic cathedrals. When a name is found, it is more than likely to be that of some ecclesiastic—some prince-bishop, whose enthusiasm led to his projecting building operations on a great scale in which he himself perhaps functioned ostensibly as architect and presided over a staff of workmen and craftsmen who did his bidding. The function of an architect, in the present meaning of the term, is therefore comparatively modern.

The volumes listed here constitute the beginning of what is intended to be a series of monographs or little biographies of men or firms of such importance that their names are written in large letters in the history of architecture. The volumes are extremely well illustrated.

STAINED GLASS TOURS IN SPAIN AND FLANDERS. By Charles Hitchcock Sherrill. 245 pp., 6 x 9 ins. Illustrated with half-tones. Price, $3.50. Dodd, Mead & Co., New York.

THE enthusiasm of a layman for a particular form of art may sometimes mean the presenting of the art from a point of view which is quite different from that likely to be taken by someone who has made it a subject for critical study. An example may be found in General Sherrill's studies of stained glass and in the volumes, "Stained Glass Tours," in various countries, wherein old glass is visited and described. In his "Stained Glass Tours in Spain and Flanders" there is given a study of glass in the old cities of these countries. Flanders, now partly in Belgium and partly in Holland, was for more than a century subject to the Spanish crown, and from Flanders came much of the sculpture, painting, and art in other forms which even today adorns the churches and cathedrals of Spain.

The glass in most old Spanish cities partakes of many of the qualities of Spanish architecture itself. It is in a sense poignant and dramatic, its somewhat heavy Gothic differing from the delicate, airy, almost lace-like Gothic of France and the restrained, refined Gothic of England, and its Renaissance assuming a form entirely its own. Spanish glass differs from that found in France and England in several ways and particularly in its color, for with the brilliant sun of the Mediterranean the glass in Spanish churches, in order to properly subdue the light, must be of a deep and somber richness quite different from that appropriate in the less sunny portions of northern France or under the cool, gray skies of England. All the characteristics and qualities of the glass of the country are touched upon by General Sherrill in these volumes which are neither glorified guidebooks nor technical treatises on glass, though they possess certain characteristics of both. It would be difficult, unless one were an experienced traveler, to plan an itinerary to include in a brief time visits to so many of the shrines of old glass, and the descriptions and illustrations of these venerable cities and their treasures of glass are presented from a viewpoint which, as already suggested, gives the studies a value which is all their own.

THE EDITOR'S FORUM

AWARD OF BOOTH SCHOLARSHIP

THE first award of the George G. Booth Traveling Fellowship in Architecture has just been made by the College of Architecture of the University of Michigan. Of the nine competitors who made entries, the designs of two were of such nearly equal merit that the jury decided to divide the $1200 income of the Fellowship between Marion F. Blood, a member of the Class of 1924, and Ralph R. Calder, who was graduated in 1923. Both have had office experience in addition to academic training, and both are students of high scholarship. The annual income of the Fellowship being $1200, each received $600, to which Mr. Booth generously added $500.

ROTCH TRAVELING SCHOLARSHIP

THIS year's award of the Rotch Traveling Scholarship was made to Eugene F. Kennedy, Jr., of Boston, by a jury consisting of Ralph Gray, George Howe and Otto Faelten. The trustees of the Rotch Fund concurred in the award, and the Boston Society of Architects voted its approval. Second place was given to Leo. A. Whelan, also of Boston, who received the prize of $100 in gold.

The income from the Rotch Fund provides for the annual payment to the recipients of $1500 for a period of two years. During the 40 years that the fund has been established, an equal number of young men have enjoyed its benefits. One-half have been Massachusetts men and the remainder have come from 12 other states and foreign countries, the only condition for competitors being that they be citizens of the United States, under 30 years of age and must have been engaged in professional work during two years in the employ of a practicing architect resident in Massachusetts.

A MEMORIAL EXHIBITION

AT the Art Center, 65 East 56th Street, New York, there is being held during the summer an exhibition of work by the late Bertram Grosvenor Goodhue which pertains to printing and book illustrating. In addition to the drawings for the bulletin of the Maryland Cathedral and for the well known Cheltenham type, there are copies of Rossetti's "The House of Life," "The Love Songs of Proteus," by Blunt, and "Sonnets from the Portuguese," the borders and initials of which were designed by Mr. Goodhue, while perhaps the most interesting item is the edition of the Book of Common Prayer, the type and decorations for which were designed by Mr. Goodhue for the Merrymount Press, while the illustrations were by the English artist, R. Anning Bell. The exhibition proves anew the value of Mr. Goodhue's skill in this work.

10,000 ARCHITECTS IN 1926

IN forming a plan for developing the membership of the American Institute of Architects, according to the New York *Times*, it has been estimated that by 1926 the number of architects in the United States will be 10,000.

The Institute, it was said, must enroll 4,000, or 40 per cent of this number, in order to make it truly representative of the profession. The Institute now has 2,774 active members. Last year a net gain of 230 was reported. This year the net gain is only 153. There has been a gain of 1,332 in three years.

The New York Chapter, founded in 1867, has nearly 400 members. The Brooklyn Chapter, founded in 1894, has about 100, and the New Jersey Chapter, founded in 1900, has more than 130 members. Broad plans of expansion, both in the public interest and in the direction of more effective professional organization, will be carried out during the administration of Mr. Waid, culminating in the next national convention of the Institute, to be held in New York in 1925 in connection with a great international exhibition at the Grand Central Palace.

THE BEAUX ARTS

IN speaking in Boston lately before a body of architectural students, Professor Albert E. Ferran, who has been teaching at the Massachusetts Institute of Technology, touched upon the early history of a great institution.

In introducing his subject the Professor gave a brief outline of the École Nationale et Speciale des Beaux Arts, which was founded by Colbert in 1648, under the title of École Academique. It received its present title in 1793. Pupils are admitted from the age of 15 to 30 years, after examination, in one of the sections of painting, sculpture and architecture.

The number of students has always been limited to those who were fitted by temperament and inclination to do the work required. In 1720 there were only 22 students, although the school had been established more than 70 years. Unless the student obtains the required number of mentions and medals he is sent back to do the work over again.

In 1761 Blondel started his academy, which by his *Cours d'Architecture* did so much to stimulate an understanding and appreciation of the art of building. In 1785 the Prix de Rome was established, and Fontaine was the first *pensionnaire* of this famous institution. The speaker told of the origin of the loge and the atelier systems, the latter by Blondel's son, the famous Pontist. During the revolution the teachers carried on the work from their private funds until the authorities realized that this was properly a government function.

The Minute You See It You'll Know That You Have the Solution

The solution to that never fully solved problem of both owners and tenants—"How can we plan an office layout that will take care of the necessary changes in years to come?"

Send for a model of Telesco Partition

At your request, we will send, without expense, a complete miniature section of Telesco Partition. The minute you see it, you can tell, how in thousands of offices it is solving the problem of movable partitions.

It will tell you exactly what our telescopic principle is, and how the partition can be made to fit any height ceiling.

It shows how the partition is *screwed* together and how easy it is to assemble and dismantle without help from an outside contractor.

You will also be able to tell why Telesco Partition can be used over and over again, without cutting or damaging it.

Write today and we will mail the model at once.

It comes in a box 13 x 20 inches, and will be an ornament while in your office.

Telesco REG. U.S. PAT OFF. Partition IT TELESCOPES

IMPROVED OFFICE PARTITION CO. 25 GRAND ST. ELMHURST, NEW YORK, N.Y.

The
ARCHITECTURAL
FORUM

Volume XLI AUGUST 1924 Number 2

Notes on Planning of Grounds and Buildings

By GEORGE HOWE

WHEN once the habit of reading architectural plans has been acquired, it is as irresistible and as satisfying as reading; even greater, for with plans the reader assumes in person the title role of the young detective, and admires in himself those qualities of unerring insight usually possessed only by imaginary heroes.

Here, then, lies the plan of a house and grounds, with the owner's name and the location clearly inscribed upon it, ready for study. It is evident that this plan has been considered as a whole from the outset, that every portion of the ground has been assigned its suitable use, and that the orientation of the property, with its longer axis running north and south, has been turned to advantage. The house itself is of a size appropriate to its surroundings, small in proportion to the gardens and service quarters about it—no Newport "cottage," bulging over its surroundings as a hen over her eggs. These may seem trivial observations, but from them, Holmes-like, it is possible to deduce the most important facts: first, that the owner is a man of sense and modesty; second, that his sound judgment has led him to select an architect of taste and human feeling.

It would be possible to puzzle the lay reader at this point with a display of the customary formulæ every architect has acquired in the schools. "See," one might say, "how the longitudinal axis is given interest and variety, first as it is broken by the transverse line of the house, supported by the suggested cross axis of the minor buttresses formed by the flower garden and the playground, and secondarily by the subordinate changes where the entrance drive develops into a court, whose width is carried through the house to the variation of the woodland vista beyond, until it is narrowed and stopped off at the inlet to the vegetable garden, to be carried on and completed by a double row of fruit trees. The relation of the various segments of this longitudinal axis to each other is studied with great discretion, as is also the relation of every part of each transverse section to the next." By these statements it is meant to convey the information that the plan does indeed meet the most exacting tests of scholastic examination. But what of that? As a matter of fact, very much of that, for the rules of the schools, in spite of every attempt of the schoolmaster to reduce them to cold and meaningless formulæ, are still based on truth and on life. Only their meaning has been lost.

Look, then, at the entire length of the property. About one-third of it is given over to the entrance drive and forecourt, just enough to leave a fine shield of woodland between the house and the highway. That is a just proportion, under the circumstances. If the circumstances were different, the just proportion would be different. There is no rule in the matter. About the equivalent portion of the length is given over to a grassy woodland walk, a pleasant place to linger, and one may assume that the owner is of a meditative and leisurely turn of mind (at least, if he is not, he cannot derive the full benefit from his delightful grounds). Its dimensions in feet and inches are of no importance, and if it were to serve some other purpose, it should be different in size, or shape, or proportion, as the case may be. So again with the flower garden, the playground, the service yard and the vegetable garden.

One might emphasize the human quality of design in plan in order to dispel two fallacies which have taken root in the layman's mind: first, feeling too great a respect for scholastic formulæ, as being absolute and unalterable; and second, a complete contempt for them as being inapplicable to real life.

How ably this problem has been solved by their use! Here is a long piece of woodland property. Cut a few holes in it, lengthwise and crosswise, place a house on it, and there it is, an Anglo-Saxon's castle, all complete! But it requires doing, and the doing is the real difficulty, and over the doing some single mind must preside. The architect's load of responsibility has become very heavy in these modern times, and he is indeed a strong man who can prevent the child of his brain from being broken on the wheel of the vicious circle before it is weaned!

Speaking of the vicious circle of modern specialization, there was a time when men in their leisurely way, though they might excel in one art or trade, were yet practicing adepts at many, with an under-

VINE-COVERED FACADE, FACING ENTRANCE DRIVE AND COURT

SHUTTERS OF MAIN DOOR STAND OPEN

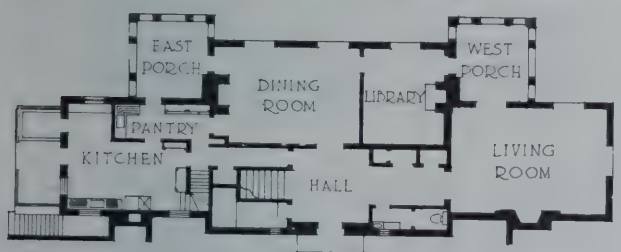
TERRACE RAIL AND SLEEPING PORCH

HOUSE OF ERNEST S. BALLARD, ESQ., HUBBARD'S WOODS, ILL.

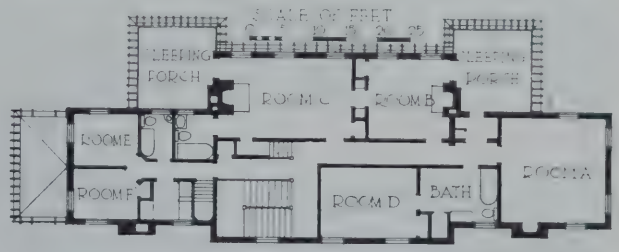
EDMUND B. GILCHRIST, ARCHITECT

UBLIC
BRARY

Garden Front and Terrace From the Allee Through the Woods



First Floor Plan



Second Floor Plan

standing of all. Such men were capable of coöperating with their fellows, and in architecture the intelligent coöperation of many minds is essential. Now, however, someone has set a new ideal of human intelligence: the one-track brain. Men equipped with such brains can only repeat a single act, under definite instructions, until told to stop. And as the type becomes more common, the number and variety of details on which the architect is obliged to issue instructions becomes ever greater, and the amount of help he receives becomes ever less. Often, in despair at last of being able to cope with the situation, he takes his place in line with the rest, and turns his responsibility over to the contractor and the owner, neither of whom is equal to it.

No such unhappy fate, however, has overtaken this charming house and garden, which Edmund B. Gilchrist, Architect, designed and built for Ernest S. Ballard, at Hubbard's Woods, Illinois. Here is a plan which shows coöperation on the part of all, the owner and the architect in particular, and every such plan today is a fresh triumph of mind over matter.

Plot Plan Showing Grounds and Buildings, Estate of Ernest S. Ballard, Esq.
Edmund B. Gilchrist, Architect

FIREPLACE AND BOOK SHELVES IN PANELED LIBRARY

SIMPLICITY OF TREATMENT GIVES CHARM TO THE DINING ROOM

HOUSE OF ERNEST S. BALLARD, ESQ., HUBBARD'S WOODS, ILL.

EDMUND B. GILCHRIST, ARCHITECT

LIBRA

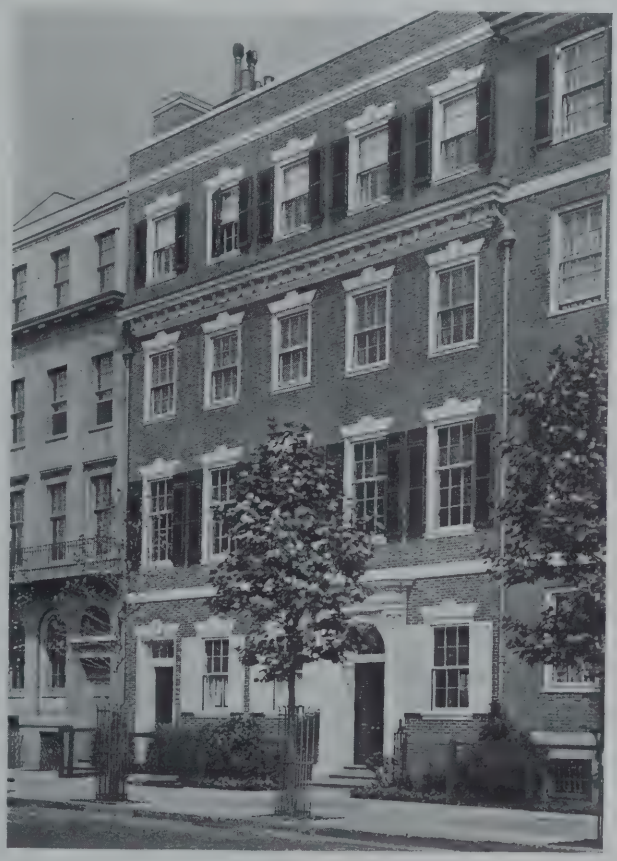
Two Notable Houses on Sutton Place, New York

THE HOMES OF MRS. W. K. VANDERBILT AND MISS ANNE MORGAN

MOTT B. SCHMIDT, ARCHITECT

DUE to the growth and northward trend of the retail shopping district, the mansions of New York's oldest and richest families are one by one disappearing from Fifth Avenue, which for the past 60 years has been the center of wealth and fashion. This exodus is taking the former residents of the Avenue into spacious apartments and remodeled street houses on the east side. Many are leaving to make their permanent homes in the country, where estates are constantly increasing in size and number, as country life occupies more and more the time and interest of city people.

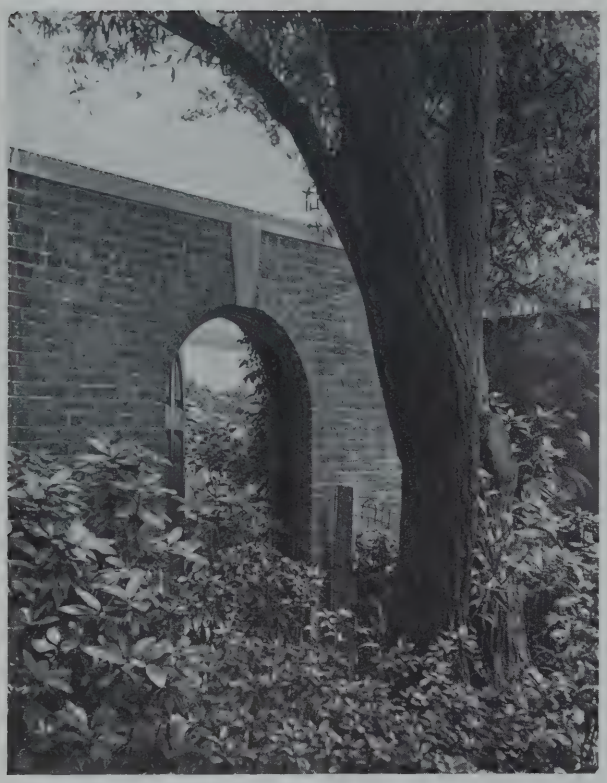
Over the minds of many, however, the spell of the streets still holds sway. The spell of old New York, to which romance and history contribute largely, may yet be felt by people with imagination in the former centers of trade and fashion, the Battery, Bowling Green, the Bowerie and Washington Square which all revive memories of colonial days. In Union Square and Gramercy Park lived the elite of the "Fabulous Forties," when the curious conventions of the Victorian Era ruled social conduct. Lovely, quiet old squares, which all of them were once, have long been given over to business or boarders, to trade or tenements.



Entrance Front, House of Miss Anne Morgan

In planning the New York of today the thrifty city fathers adopted the economical gridiron plan of avenues and streets, leaving scant space for the squares and little parks which make London so lovable and livable. As the old time squares and parks have been abandoned to the advancing tide of commercialism, the householders have been seeking in vain for other open spaces on which to face their houses. The avenues and streets enclosing the open acres of Central Park are completely given over to club houses, great apartment buildings, hospitals, museums and fast disappearing palatial mansions. There is no chance here for the small house dweller, so he is turning to the side streets, remodeling with individual taste the old high-stoop houses, thus happily and rapidly replacing the monotonous mediocrity of unbroken brownstone fronts. But this opportunity for individualism, expressed in most of the remodeled street houses, is fortunately not sufficient to satisfy the artistic taste and romantic spirit of some; fortunately, especially for architecture, as otherwise many unusual and delightful houses would never have been built. houses owing much of their charm to their immediate environs, without which their particular picturesqueness would not have been possible or practicable. Such locations, desirable and accessible, have been eagerly sought but seldom found on the map of Greater New York, so it is only due to the twists and turns of the East River that such locations as Beekman and Sutton Places exist. Community combinations by the owners of adjoining property have established such spaces as "Turtle Bay" on East 49th Street, where 20 "back yards" were transformed into a group of delightful low-walled gardens, all opening upon a broad center walk with seats and fountains among the shrubs and trees, making pleasant interruptions. Many owners of remodeled street houses are turning their high fenced back yards into delightful little gardens, but it is only in the larger enclosures, such as "Turtle Bay" and Sutton Place, that a real beauty and picturesqueness are obtainable.

Sutton Place is a short street running from East 57th to 58th Street, the rear of the lots on the east side of which overhang the East River, just south of the Queensborough Bridge. Back of the houses on these lots a common lawn and garden looks down onto the fields and buildings of Blackwell's Island and the river with its constantly shifting scene of maritime activity. Such was the



Gateway into Garden of the Vanderbilt House

location, one of the most picturesque and secluded in New York, possessing much of the charm of the Thames Embankment, London, which Mrs. Vanderbilt and Miss Morgan chose for their city houses.

In Mrs. Vanderbilt's house, Mr. Schmidt, the architect, employed a free adaptation of the style of the English Renaissance, using as the inspiration for the main entrance one of the beautiful doorways in King's Bench Walk, London, designed by Sir Christopher Wren, and for the garden entrance a hooded doorway of the early Georgian period. The long front facade of this house, which faces south on 57th Street, is continued to the edge of the cliff overhanging the East River by a high garden wall. The two end elevations are narrow and comparatively unimportant, except that the east end has three tall casement doors, that in the center hooded, which open through antique iron gates upon a paved terrace overlooking the garden and river below. Trimmed with limestone, and built of old brick obtained from the building previously occupying the site, laid up with natural colored cement, and toned down slightly with a stain that gives the brickwork an appearance of age, the house might have been built a century ago.

The plans show a basement and three floors. In the basement are located the service and mechanical departments of the house, such as boiler room, man's room and bath, trunk and storage rooms, kitchen and servants' hall. On the first floor, which is seven steps above the sidewalk, there are a large dining room, serving pantry, coat room and reception room. The second floor plan shows a long drawing room, center stair hall and one bedroom suite. The third floor has one large bedroom, with connecting dressing room and bath on the east, and a maid's room.

To a certain extent the interior was planned around an unusual collection of charming old furniture and other rare antiques which had been collected by Mrs. Vanderbilt during a period of many years. The dining room, for example, was designed to use as mural decorations and color scheme a set of old Dutch decorative paintings. And the reception room on the first floor, known as the little Georgian parlor, was built to take the antique deal paneling of an old English room. The decoration and color tone of the main hall and circular stairway, were carried out by Allyn Cox, who painted the walls in the Chinese manner to harmonize with two painted Chinese pagodas from the Royal Pavilion in Brighton, which were placed in this hall. The drawing room, on the second floor, is a splendidly proportioned room, 18 by 32 feet, with windows on the south and east. The severe panels and pilasters give dignity and reserve to the treatment of this room which is pleasingly relieved by a beautiful old Italian door opening into the hall, corner bookcases, comfortable chairs and couches. Lamps, tables, screens and other antique pieces add interest and livableness to this drawing room, in which the color scheme of blue and gold is contrasted with the dark marble fireplace mouldings.

Modern convenience and comfort mark the arrangement of the bedrooms and dressing rooms, which are decorated in a simple and unostentatious

Garden Terrace of the Vanderbilt House

manner. As practical requirements obviated the necessity for a cellar, all the mechanical equipment of the house, such as gas-fired steam boilers, hot water heater and vacuum cleaner machinery, is concentrated in a small machinery room in the basement.

The Colonial style, which is a development in this country of the architecture in England designed during the reign of the several Georges, was used by Mr. Schmidt for the design of Miss Morgan's house, adjoining the earlier English Renaissance residence of Mrs. Vanderbilt. The red Harvard brick, white painted shutters, and white marble trim recall the old houses of Philadelphia, Salem and New York. The garden or river front, which like the street facade, has a graceful doorway with deep paneled reveals, is more attractive architecturally because of the dormer windows and setback.

The plans show a basement and four floors, which have all been studied and developed with great care and cleverness, so that no waste space exists. The basement contains the mechanical equipment of the house, including the elevator machinery. To avoid the necessity of furnace-man, coal-man, ash-man, ice-man and garbage-man, the most modern mechanical appliances, such as incinerator for garbage, refrigerating plant, vacuum cleaner machinery, gas-heated hot water and steam boilers, were installed. The entrance on the first floor shows two outside doors, one entering the vestibule and main hall, the other leading into a long corridor on which open the kitchen, servants' hall, stairway, and man's room. Beyond the main hall is a spacious dining room, opening onto a paved terrace and open lawn overlooking the river. On the second floor is a large drawing room across the entire street front, which opens into both the elliptical stair hall and the foyer hall.

Boudoir Mantel, the Vanderbilt House

Bedroom Fireplace, the Vanderbilt House

The interior of this house is also interesting because of the old and unusual furnishings, giving great distinction and charm. Entering from Sutton Place, a view of the river, through the vestibule, hall and dining room, which are on axis, may be had. In the hall and dining room a floor patterned in black, yellow and white marble, adds a rich note of color. An oak stairway taken from an early Georgian house, leads from the entrance hall to the drawing room floor above. Here an interior curved stairway, hung on the walls of an elliptical well, extends for two flights to the upper stories. Instead of the usual skylight, a more pleasing and more effective means of lighting this stair well has been found in the use of octagonal bull's-eye windows placed in the sides of the stair bulkhead or cupola. The library on the river side of the second floor, which is paneled in pine taken from an old English house, has brass grilles in the bookcase doors and star-backed crystal appliques on the pilasters. The small reception room on this floor is papered with a hand-painted Chinese Georgian wall paper, against which is hung an old Chinese Chippendale overmantel decoration.

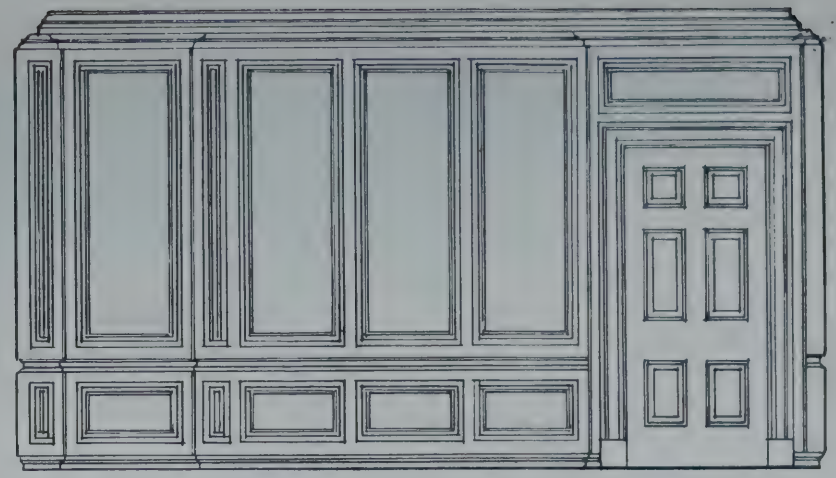
No more valuable or successful examples of the consistent and intelligent use of English architectural precedent in the designing of American houses are to be found than these two houses on Sutton Place.

OLD ENGLISH WOODWORK ADDS INTEREST TO THE RECEPTION ROOM, KNOWN AS THE "LITTLE GEORGIAN PARLOR"

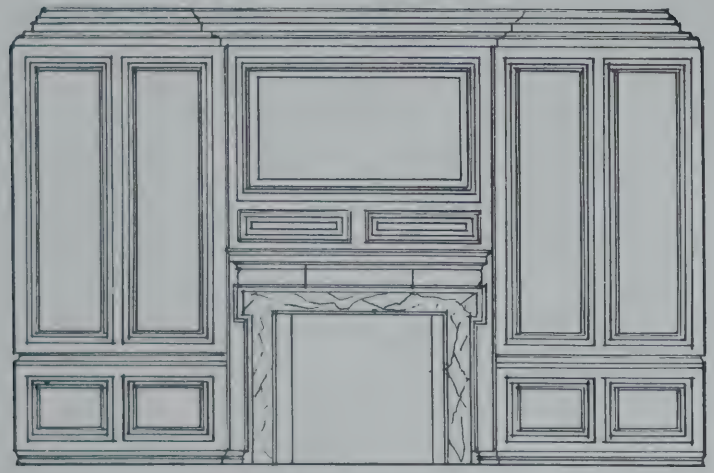
HOUSE OF MRS. W. K. VANDERBILT, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

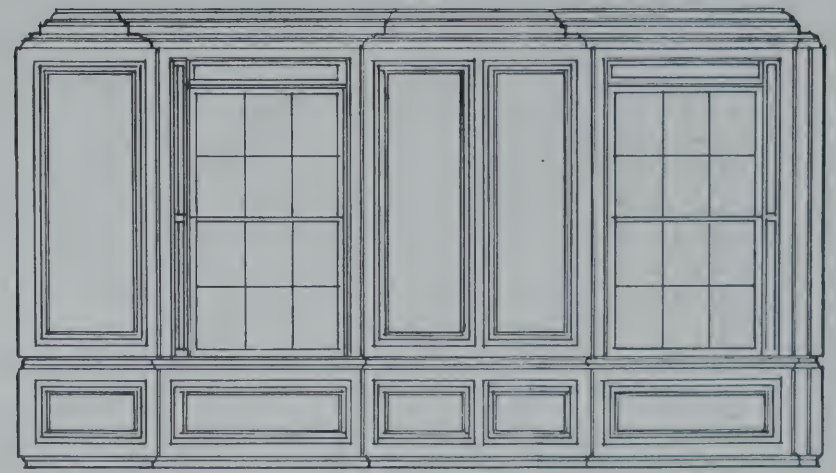
SOUTH ELEVATION



EAST ELEVATION



NORTH ELEVATION



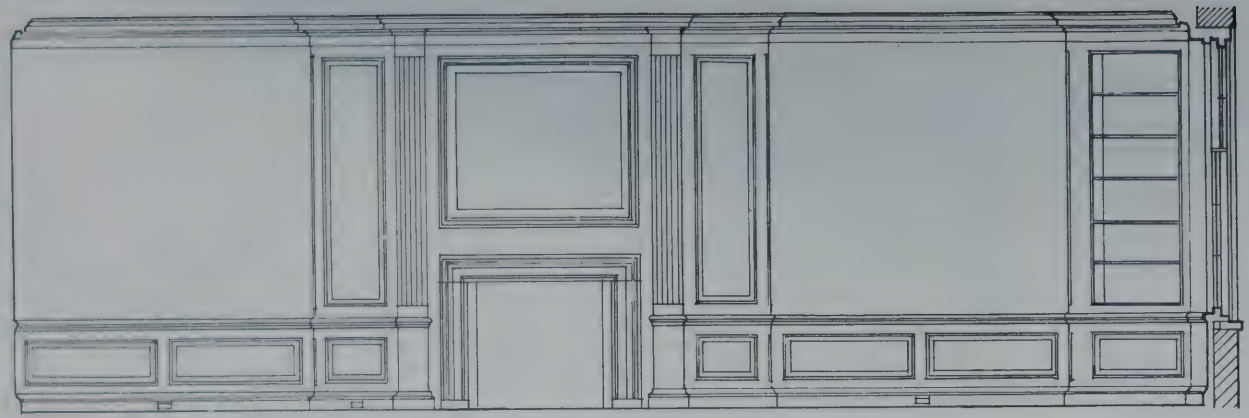
WEST ELEVATION

RECEPTION ROOM
RESIDENCE OF MRS. W. K. VANDERBILT

MOTT B. SCHMIDT - ARCHITECT

SCALE: 1/4" EQUALS ONE FOOT

ONE SIDE OF DRAWING ROOM
HOUSE OF MRS. W. K. VANDERBILT, NEW YORK
MOTT B. SCHMIDT, ARCHITECT



NORTH ELEVATION

EAST ELEVATION

SOUTH ELEVATION

WEST ELEVATION

DRAWING ROOM
RESIDENCE OF MRS. W.K. VANDERBILT

MOTT B. SCHMIDT ~ ARCHITECT

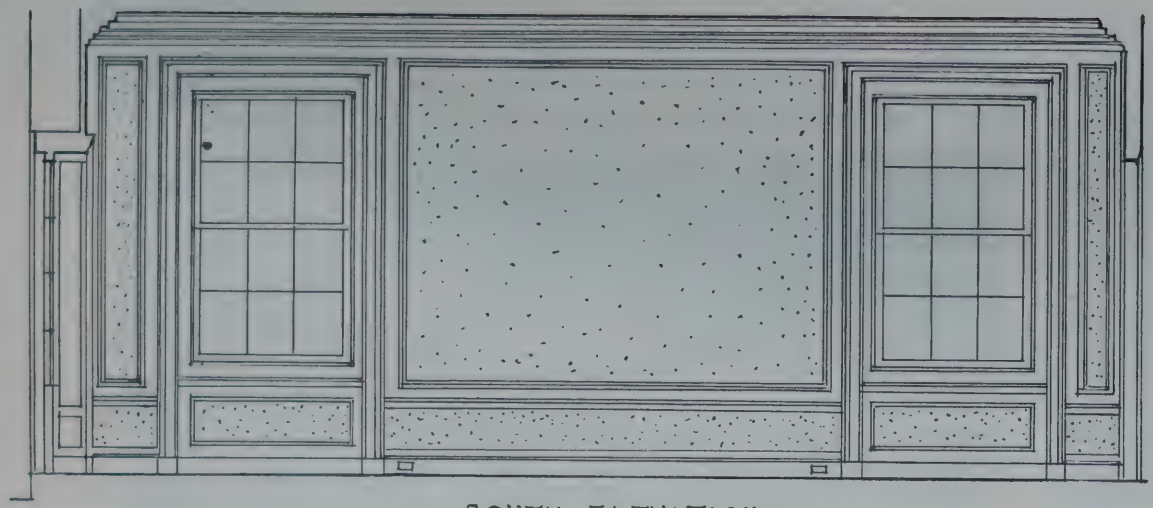
SCALE: 3/16" EQUALS ONE FOOT

DINING ROOM, LOOKING TOWARD GARDEN TERRACE

CORNER OF DINING ROOM, WITH DOOR INTO HALL

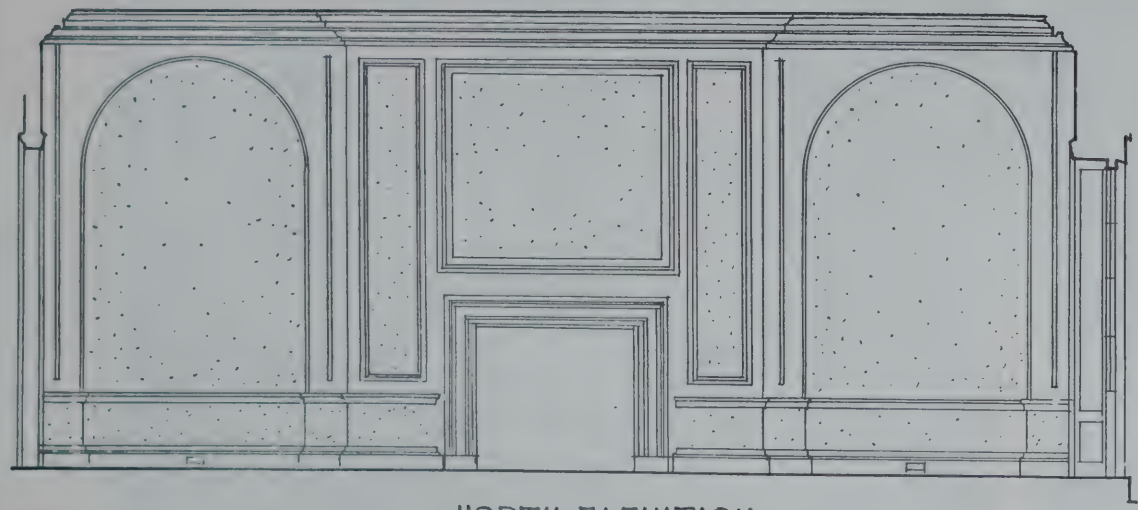
HOUSE OF MRS. W. K. VANDERBILT, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

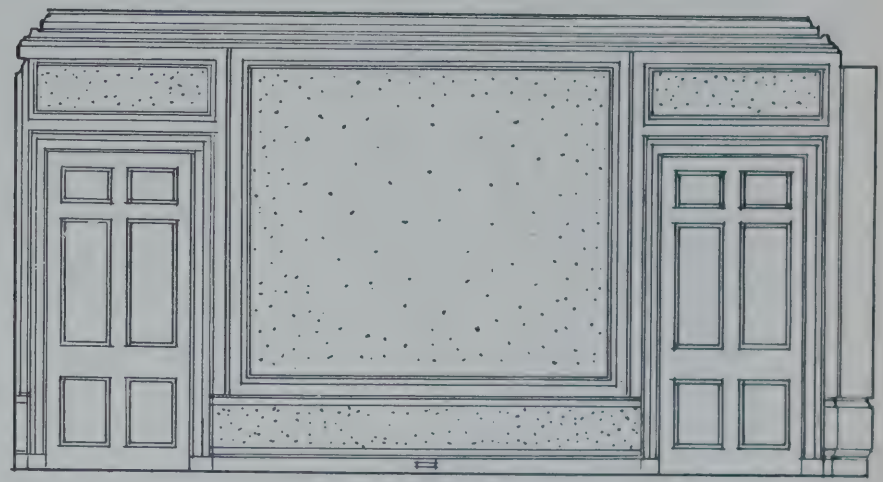


SOUTH ELEVATION

EAST ELEVATION



NORTH ELEVATION



WEST ELEVATION

DINING ROOM
RESIDENCE OF MRS. W. K. VANDERBILT

MOTT B. SCHMIDT — ARCHITECT

SCALE: ¼" EQUALS ONE FOOT

GARDEN ENTRANCE TO HOUSE OF MISS ANNE MORGAN

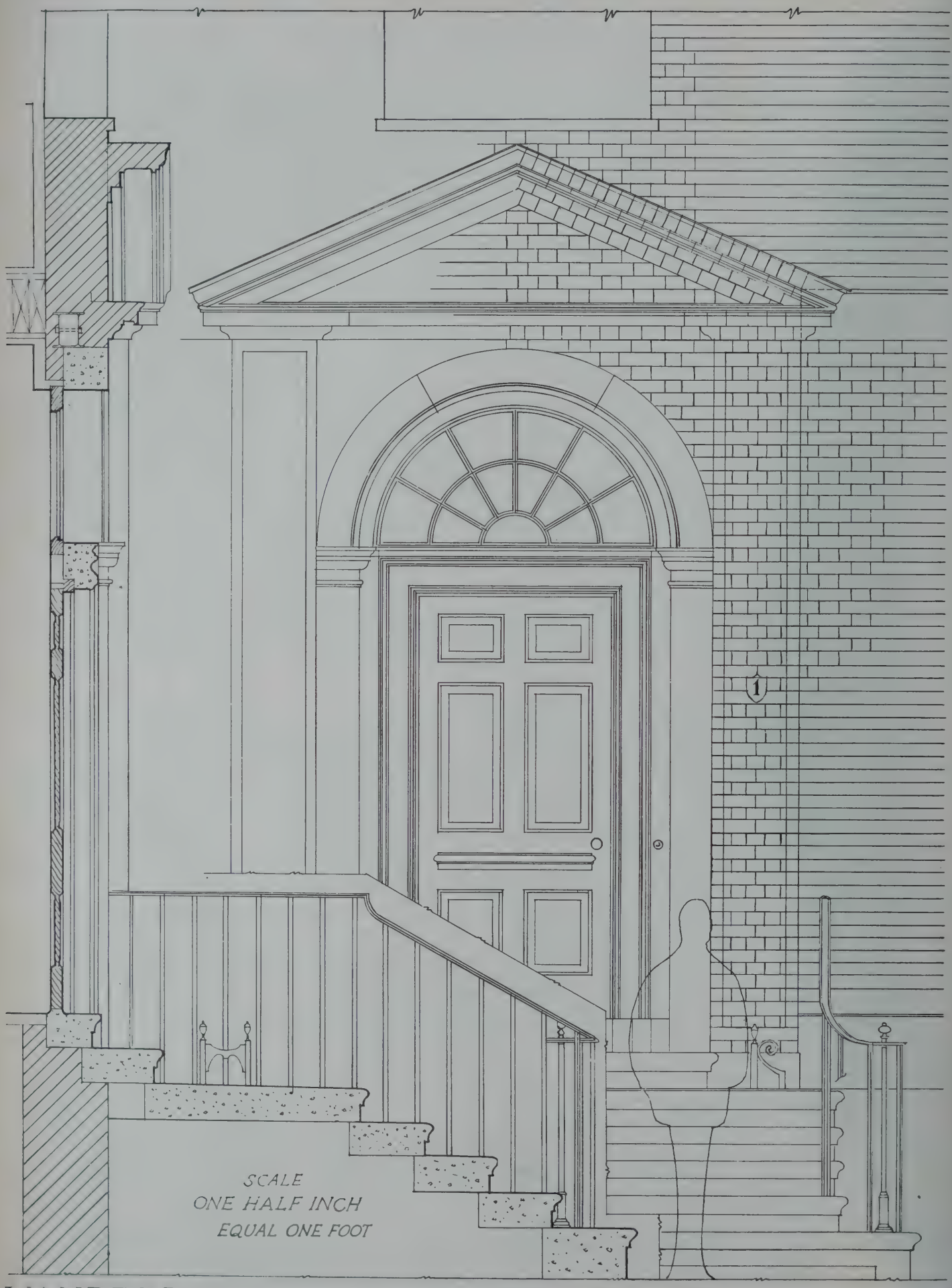
STREET DOOR TO HOUSE OF MRS. W. K. VANDERBILT

MOTT B. SCHMIDT, ARCHITECT

PUBLIC LIBRARY

MORGAN HOUSE, SUTTON PLACE NEW YORK CITY

MOTT B. SCHMIDT, ARCHITECT



VANDERBILT HOUSE, SUTTON PLACE NEW YORK CITY

MOTT B. SCHMIDT, ARCHITECT

The Evolution and Development of Jackson Heights

ANDREW J. THOMAS, ARCHITECT

IN commercial architecture there has long been established the rule that business shall govern design. But old as the rule is, it is strangely misunderstood in practice. Too often people think of it as implying an underlying conflict between architecture and business, requiring the sacrifice of architecture, whereas it really means the intelligent coöperation of both, guided by the simple, common sense principle that architecture should serve the needs of the case. In some circles it is assumed that the architect takes too little interest in safeguarding profits in his design, and that he seeks expensive decorative effects which, if the business man did not forbid, would endanger the financial success of the building. How often do we hear a business man tell how "he had to keep his architect down on the earth in order to make the work a success!"

But the time has come to realize that there are two sides to this controversy. This fault finding has lasted so long that it is becoming hackneyed. The whole point of the matter is that the business man may be just as unbusinesslike in real estate as he claims the architect to be. It is time to establish the opposite truth, which is that the architect who lets his imagination carry him too far from the conditions of the problem is nowadays offset by the business man who has too little vision to make the most of his opportunity, who is unprogressive, and who sticks to customs, blindly following old practices without a thought as to whether these practices are sound or as to whether changing times have made them in any respect obsolete. This is not said to provoke further controversy, but only to show that the criticism of architects as being unbusinesslike is too often made thoughtlessly, and as thoughtlessly accepted. One may even assert that architects have been somewhat too humble in accepting such criticism, to the injury of business as well as of architecture. It may not be the part of the architect to instruct the business man, but he can certainly bring imagination to bear in giving effective form to business ideas; and, what is also important, he can cultivate sufficient knowledge of business principles to be able to recognize the possession or lack of them in his clients, and to seek the type of client who has business vision to couple with his own artistic imagination. As already suggested, what is needed in commercial architecture is coöperation, and coöperation means, not a one-sided, thoughtless dictation by the business man, but the active participation of the architect in the project, working in harmony with his client.

Entrance Gate to Garden of "The Towers," Jackson Heights, New York

It is important to understand that business vision is more essential in real estate than in many other fields. Some products, like food or clothing, are soon consumed and cater only to the wants of the day, but a commercial building is produced for use during a score of years or longer, and requires the finest possible business judgment in foreseeing future trends and in anticipating them in design in order to prevent too rapid obsolescence. The financial success of a building, therefore, may depend more on market conditions of future years than on the market today.

It is in this foresight that the real estate world has been too deficient. Indeed, the architect may even claim that some of the principles which he introduced into architecture in the last half century have proved to be sound business as well as good architecture. When, years ago, the architect first insisted on the careful planning of American buildings, he opened up a field of vast economies in cutting out waste space and in efficient use of the space provided. When the architect preached sound construction and durable materials, he did not do so solely to obtain decorative appearance, but also to enhance value by making buildings endure, by holding their attraction for tenants, and by reducing depreciation; and lastly—which is the point most in controversy—if the architect has fought for beautiful form and craftsmanship, he has only anticipated the time when the increasing wealth and cultivation and appreciation of the finer sides of life among the American people will be lifting them out of the

Street Facade and Garden Entrance

Center Fountain and Seats in Garden

"The Chateau," Jackson Heights, New York

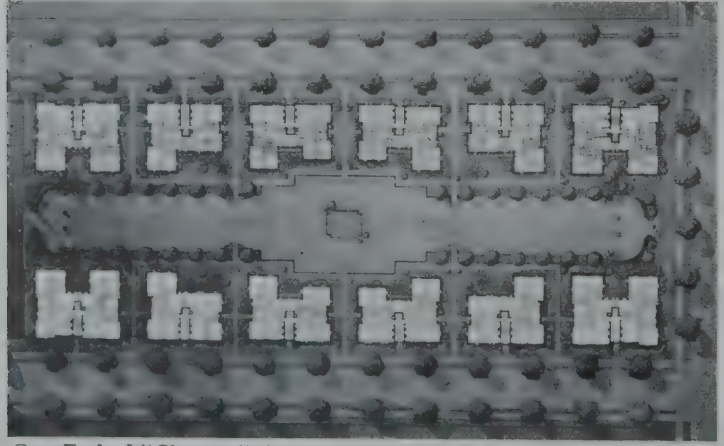
ugliness and baldness of the Victorian era into a more urbane period when, to put it bluntly, they take pride in a good appearance in their buildings and their streets and their neighborhoods, and will pay well him who satisfies their demand. Whenever he has disregarded these sound principles, the realtor has been the creature of habit, opposing progress and new ideas.

To some extent, at least, the American architect can claim that he has contributed to the business side of commercial architecture. He has in many respects understood the buyer's wants better than the business man. His contribution is only beginning, and it will grow greater as his experience increases in scientific analysis and in expert design.

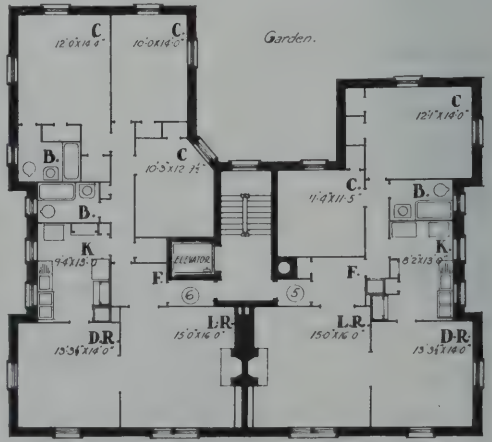
The best illustrations of the correct principles of commercial architecture may perhaps be found in the apartment house field. These illustrations, moreover, occur alongside older and less businesslike methods, and as a result a most instructive set of examples is now available for comparison.

One may assert that, except for a very few isolated cases, apartment house architecture did not share extensively in the remarkable progress made in other classes of buildings during the last 40 years. Even the most luxurious types of tall elevator apartments showed only a superficial progress, mainly confined to interior decoration and better architectural facades. In fact one may visit one of the best of the old 1890 elevator apartments, and, except for an old fashioned, somewhat "Victorian" appearance, one will find it not essentially different from buildings built since the war. The non-elevator apartments also have had little improvement during the same period, except for the increasing use of a wide frontage, although recently there has been some response to the new architectural ideas expounded by Andrew J. Thomas. Of what other types of buildings could the same be said? In contrast to the unprogressiveness of apartment house design, what a change has been wrought during this same period in the American individual house, the school, the library, church, railroad station, office and store buildings!

Only since the war, around New York have there been signs of awakening. Unfortunately, a good deal of this improvement has been superficial. Much is heard of "talking points," chiefly in the shape of minor details of finish and of bathroom and of kitchen equipment. As an example, in many



One End of "Chateau" Group Land is Reserved for Other Buildings

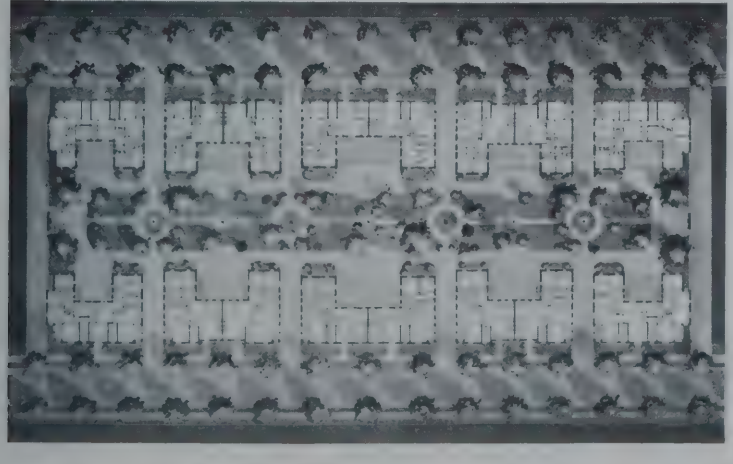


Typical Middle Unit, "The Chateau"

Garden Terrace of "Linden Court"

Italian Influence Is Evidenced in "The Towers"

of the "walk up" apartments of the cheaper type in Greater New York one sees a lavish use of marble wainscoting in entrance halls, of tile floors in upper corridors, of tile wainscots in bathrooms, and of tile floors and wainscots in kitchens. This expensive finish goes along with a large outlay for equipment. At the date of writing, a large group of very cheap small one-family, 6-room brick houses is being put on the New York market, each house saddled with an uncalled-for expense of over $1,000 in the shape of finish of the kind described, and having, in addition, a wall paneling of stiles and rails applied over the plaster walls in the downstairs rooms, five ceiling electrical outlets in the dining room plus four wall brackets, and in the bathroom a separate tile shower compartment besides the tub. Incidentally, the main stairs are so steep that one can hardly use them. Such expensive details belong to the very largest mansions, and their lavish use in commercial architecture is the sort of thing for which formerly an architect would never have been pardoned had he introduced them into this class of low priced housing. Yet the speculators who put up such structures claim to "know the market," and they make a great to-do over such incidentals as "talking points" in salesmanship. Of course, the real fact is that these "talking points" are put forward to dazzle an ignorant class of buyers and to distract their attention from the real situation, which may be that the same houses, despite their extravagant finish, are deficient in the real essentials of sunlight, outdoor exposure, garden outlook, proper planning of rooms, elimina-



Both Ends of "Linden Court" Land is Reserved for Other Buildings

Garden Detail, "Linden Court"

One Unit of "Linden Court," Jackson Heights, New York

tion of waste space, and in sound, durable, structural materials. One hears "modern conveniences" extolled on all sides, yet what modern conveniences can supplant the ancient conveniences of sunlight, fresh air and garden?

It needs little argument to prove that, wherever such crude practices are common, they are bound to fail in the long run, especially after the boom and the existing sellers' market have disappeared. Structures of this type, of which there are countless examples, will not hold their values for many years in the face of the awakening education of the public to better housing standards. What the unprogressive investor fails to consider is the big educational movement in favor of better homes which is going on.

Anyone in the publicity field knows that the American people seem to have an unquenchable thirst for new ideas in homes, whether viewed from the angle of architecture, of landscape architecture, interior decoration or house furnishing. A number of powerful national magazines of huge circulation like *House & Garden, House Beautiful* and *Good Housekeeping* specialize in this field, and popular publications devote immense space to it. There are also the Architects' Small House Service Bureau and the educational work of the United States Government, universities and other public spirited agencies. This vast propaganda is bound to have its effect on the buying public, and it is creating a demand for real improvement in housing practices which the speculator must meet. The propaganda goes into the most elaborate detail, and every feature of a house is exhibited and studied for practicality, econ-

Entrance Doors, "Linden Court," Show Fine Detail

Doorways of "The Towers" Show Interesting Grillework

omy, charm and artistic appearance — the real "talking points." Here is the true market for the housing speculator during the next few years, and he courts disaster if he ignores it.

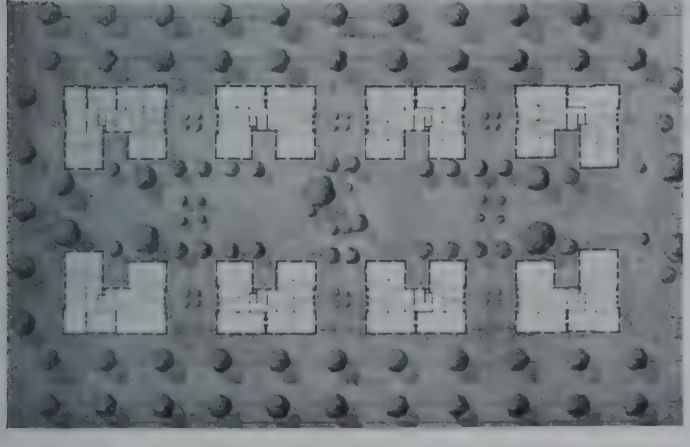
A very few real estate operators have sensed this demand for progress, and they have coöperated with the architect in meeting it. No better example of sound business policy in regard to architecture can be cited than that of the Queensboro Corporation at Jackson Heights, New York. The Queensboro Corporation constantly studies its market and insists on progress in design. To use the business phrasing which is consciously adopted in this article for purposes of illustration, it believes in improving its product in every way, from the biggest essentials of architecture down to the smallest detail. Each year it brings out new designs and new models and new improvements, in the same spirit of progressive evolution that has characterized the motor industry in its leadership of American business.

General View of "The Towers," Jackson Heights, New York

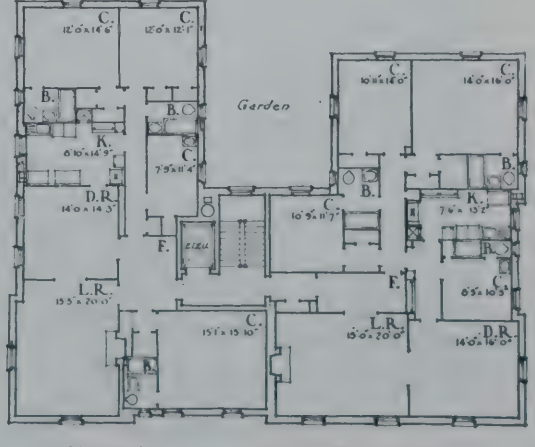
Such a program involves a vast deal of work and it requires initiative. It offers the architect a real opportunity, because he is encouraged to progress. His work becomes real expert professional service, instead of incidental draftsmanship. It requires highly coördinated architectural design in the fundamentals and in the relation of building to interior decoration and to the garden. In place of a single flat exterior wall along the street, so characteristic of the stereotyped apartment, the buildings have four exterior walls, with roofs, breaks, projections and other details—in other words, the elevations become a matter of three dimensions, or true architecture, making possible variety in treatment.

In the process, custom has no mystic sanctity to be obeyed without a question. The truth is that many real estate "customs" will not stand analysis, because they may only register the fact that people have been persuaded to accept a poor arrangement in default of anything better. A case in point is the dictum that the rear apartment and the rear bedrooms will bring less rent than those located on the street front. But Mr. Thomas reasoned that this so-called custom grew out of the fact that the difficulty with rear locations was due chiefly to bad planning, with dark, congested courts and poor outlook; and that a rear location in the midst of a great garden was much superior to one on the street and would bring a higher rent. His view was accepted by the client and has proved correct.

The most radical break with custom came in the adoption of individual buildings in place of a solid mass along the street. Mr. Thomas adopted this innovation in arrangement, because he was able thereby to get more sunlight, more outdoor exposure



Land at One End of "The Towers" Is Reserved for Other Buildings



Typical Corner Unit, "The Towers"

and better outlook, a larger number of rooms, and a more attractive appearance. The new arrangement was first tried out very cautiously as an experiment, on a group of garden apartments, called "Linden Court," built in 1920. In the "Linden Court" group the buildings are placed only 15 feet apart in the narrowest dimension and cover only 40 per cent of the area of the site. The experiment proved a striking success. People welcomed the new idea, and tenants flocked into the buildings in preference to taking apartments in the older solidly built types, a group of which was completed at the same time and which rented more slowly. Encouraged by the success of the experiment, a second group, the "Chateau" apartments, was built in 1922. The most important facts about this second group are that it covered 37.4 per cent of the site, and that the buildings were placed a little farther apart—19 feet, 6 inches. Again the success of the operation emboldened its authors to go much further, and in the "Towers," a group of fireproof luxurious elevator apartments just completed, the area occupied is only 36 per cent and the buildings have been placed 36 feet, 8 inches apart. In this architectural evolution the passages between the buildings have developed into real side gardens, opening into the great center garden, and the individual buildings have the effect of being placed in the midst of a garden setting, almost like a country house. Likewise the rear court has almost disappeared from the plan. It will be noted that the individual apartment in the two later groups has been given better outdoor exposure. In the evolutionary process the elevations and every detail of arrangement and equipment have been improved.

One of the Gardens of "The Towers"
Noel Chamberlin, Landscape Architect

This vision and business judgment is characteristic of the Queensboro Corporation's business policy. Their architecture is no capricious experimentation, but a steady, sure evolution, year by year, based on the fundamental principles of imaginative architectural design and business vision. Architecture should welcome such a demonstration, because it sets an example to real estate of real coöperation with the architect in a search for progress.

Interior Garden of "The Towers" Shows Formal Arrangement

The Smaller Civil Architecture of England

II. BERKELEY'S HOSPITAL, WORCESTER

By ROGER WEARNE RAMSDELL and HAROLD DONALDSON EBERLEIN

BERKELEY'S HOSPITAL, in Worcester, is not a place intended for the care and healing of sick folk, but a hospital in the ancient sense of the word, a place of hospitality where a limited number of aged, destitute and needy persons may find a comfortable home.

The founder was Robert Berkeley, Esquire, of Spetchley, in Worcestershire, and is described by John Evelyn in his Diary as a man of distinguished parts, "curious in gardening." By his will, dated December 13, 1692, Robert Berkeley devised certain funds to be applied to the foundation and support in perpetuity of an establishment of almshouses in Worcester for "12 poor men and one poor woman." Why this whimsical apportionment of one lone woman to 12 of the sterner sex, history does not record. The administrators of the charity later increased the number of men to 14. Besides the 13 pensioners originally designated as beneficiaries of this bounty, there was to be also a chaplain with a stipend of £20 a year. A steward was likewise to be appointed to administer the affairs of the Hospital, receiving the same compensation as the chaplain. The control and management of the foundation were vested for all time in the Mayor, Aldermen and Town Clerk of the City of Worcester.

In 1705 land was purchased in the Foregate, near Worcester Cross, and some time thereafter work was begun on a group of buildings comprising a chapel, lodgings for the chaplain and the steward, and two rows of small dwellings facing the courtyard, for the pensioners, in which they might live independently one of another, maintaining their individual privacy. Just when the buildings were completed is not certainly known, but as there is record among the old accounts of the vault beneath the chapel being let at Lady Day, 1711, to a wine merchant for storage purposes, all construction was presumably finished in 1710, if not before.

The architect of Berkeley's Hospital is not known. If there was indeed any architect at all, we can only conjecture who he may have been; if he supplied the original design, it appears from existing evidence in the fabric itself that he must have left the carrying out of the work without supervision and altogether in the hands of the master builder, who seems to have been lacking either in the matter of conscientious oversight or else in experience. Other-

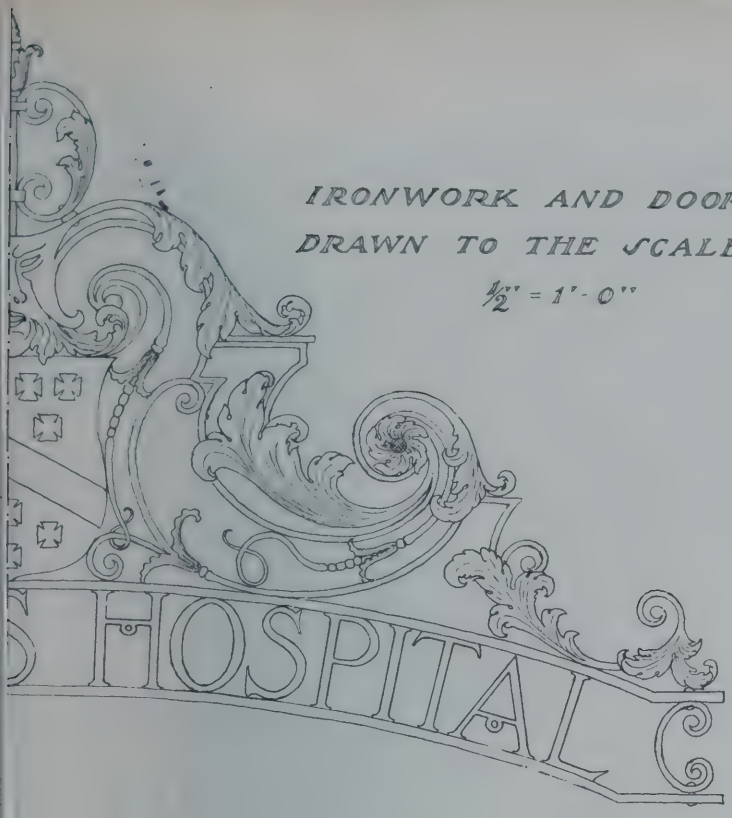
Houses of the Chaplin and Steward Flank the Gateway

AT THE END OF THE COBBLE-PAVED COURT IS THE CHAPEL

ENTRANCE DOOR TO ONE OF THE PENSIONERS' HOUSES

BERKELEY'S HOSPITAL, WORCESTER, ENGLAND

LIBRA

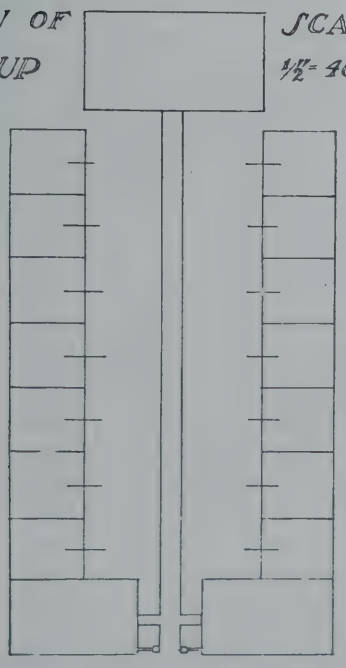


IRONWORK AND DOORWAY
DRAWN TO THE SCALE OF
½" = 1'-0"

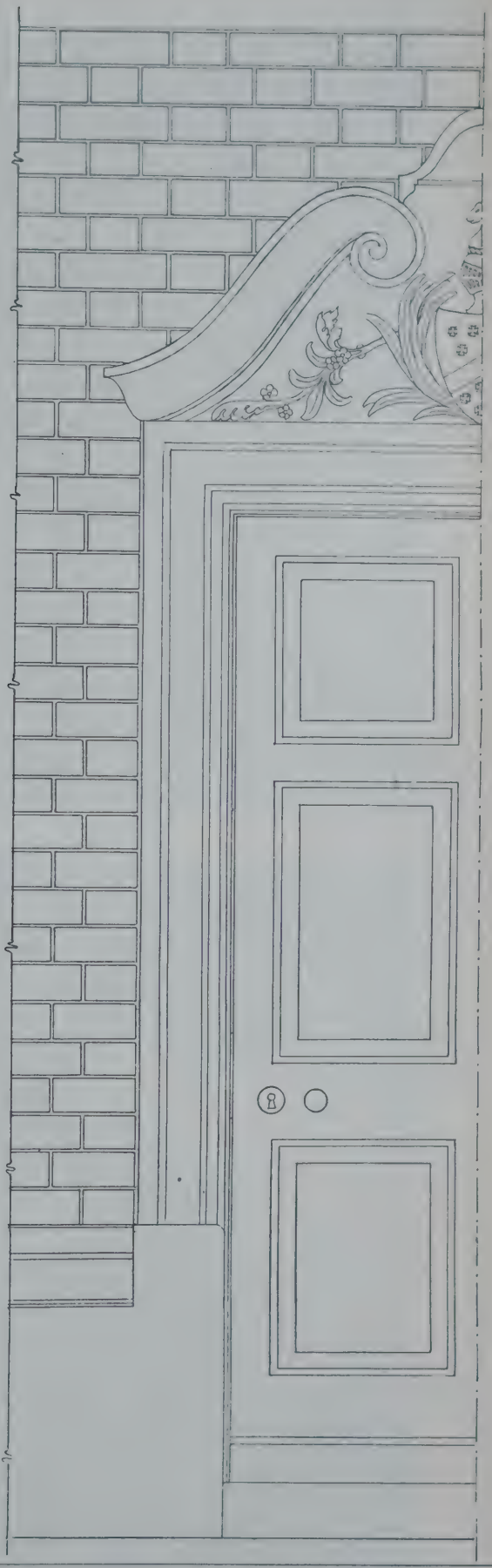
PROFILE OF DOOR JAMB
SCALE 1/4 FULL SIZE

BASE
COURSE
1/8 FULL SIZE

PLAN OF
GROUP



SCALE
1/32 = 40'-0"



BERKELEY'S HOSPITAL
WORCESTER

GRACEFUL CRESTING SURMOUNTS THE ENTRANCE GATEWAY

OVER THE DOOR TO THE CHAPLAIN'S LODGING, ORNAMENT FILLS THE PEDIMENT

BERKELEY'S HOSPITAL, WORCESTER, ENGLAND

SCALE 1/16" = 1'-0"

BERKELEY'S HOSPITAL

WORCESTER

wise it is hard to account for the patent disparity in the height of the gateposts and certain other features that are obviously awry, and awry not because of any exigencies of plan, any settling of foundations, any intentional subtlety, or any of the lines of the plot on which the Hospital stands. These little indications of slovenliness in construction (it is impossible to find a more euphemistic name for them) along with some settling of the foundations here and there so that the walls in several places are visibly out of plumb, made it extremely difficult in more than one instance to compose photographs that would not look painfully askew.

Notwithstanding the constructional shortcomings just noted, which after all lend a peculiarly piquant individuality to the ensemble, just as the irregularities of the human face often enhance its interest, Berkeley's Hospital possesses both distinction and charm in large measure, combined with the impressive force and virile accent so generally characteristic of civil and domestic architecture alike at the date of its erection. On each side of the gateway, with its camels' heads and its gracefully fashioned wrought iron "overthrow" or cresting, are the respective lodgings of the chaplain and the steward. Between the houses of these two officials a broad pathway gives access to a wide, cobble-paved court on which face, from opposite sides, the little one-story houses of the pensioners, while at the far end, is the chapel with an effigy of the founder in a niche.

Each pensioner's house consists of a single large room, so arranged, however, that it is virtually in two easily separable parts—a sleeping cubicle and a living room. Each pensioner does his or her own cooking and housekeeping, so that there is no occasion for a refectory. The plan of the group is both agreeable in point of composition and convenient for the general purposes of administration as the Hospital is organized. The whole group is built of the red face brick, in such esteem in Queen Anne's day, of a very rich, yellow hue, and all trim except the cornices is stone. What the stone is it is impossible to say as it is covered with many successive coats of buff paint. The greater part of the original glazing has been replaced and the old robust bars and muntins have given way to sash construction of a rather weak type. The aspect of the pensioners' houses has been much altered in recent times by the substitution of leaded quarry glazing for the sashes formerly used.

The Entrance Doors to the Houses of Chaplain and Steward Are Inside the Gateway

Spanish Influence at Palm Beach

THE HOUSES OF ADDISON MIZNER AND DR. W. S. KINGSLEY

ADDISON MIZNER, ARCHITECT

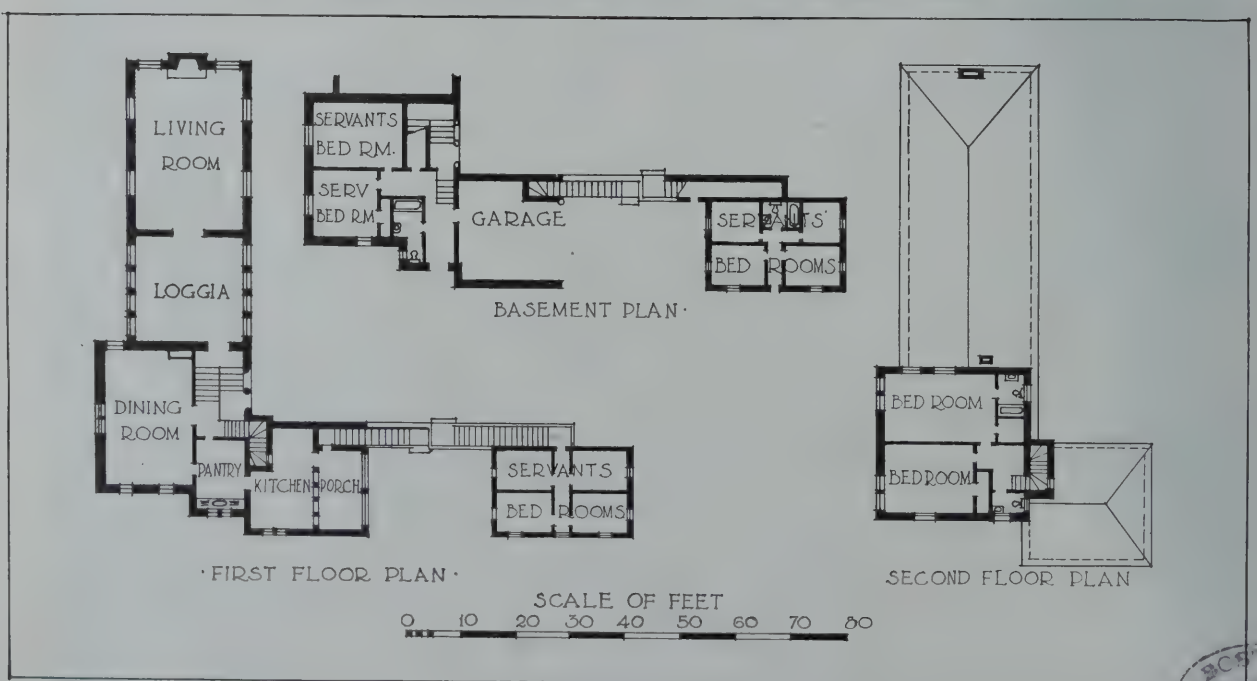
ARCHITECTURE, like plants and trees, should be indigenous to the soil from which it springs. That is to say in plan and elevation it should suit the climate and the scene of its environment. Fortunately, this most important trait, suitability of design, is being considered and carried out to a much greater extent today than ever before. Thus in southern California, already replete with Spanish tradition, the Italian and Spanish styles are being used more and more consistently and generally. As Florida has much the same climate as Santa Barbara and Pasadena, although lacking the romantic background of the Spanish missions, the architecture of southern Europe is equally suitable there.

Among the many examples of the use of Spanish architecture in Florida, two houses at Palm Beach recently designed and built by Addison Mizner, Architect, show the possibilities of this picturesque style. Imagination and artistic appreciation are strongly indicated in the designs of both of these houses, not only in the elevations but in the plans also, which are similar in general treatment. Each shows a rambling arrangement of rooms around two sides of a patio. Each has a large loggia or room open on two sides, separating the living room from the dining room and service wing. The topography of the site of Mr. Mizner's house, which is the smaller of the two, permits a main entrance and garage on a lower level than the living rooms and gardens, adding much to the picturesque irregularity of the design. In size as well as in detail Dr. Kingsley's house is more pretentious, more the Spanish villa than the farmhouse type. Its entrance drive, following the high garden wall on one side, and its ornate entrance door with open balcony above, are dignified and imposing. The long, low roofs of variegated tile carry the eye far back over the patio wall, above which beckon the waving leaves of scattered palm trees. The patio, which faces east, is shut in on one side by the wall of the entrance drive, and on the other by the buildings and courtyard wall of the service wing, giving it the quiet seclusion and indefinite charm of an old Spanish enclosure.

A broad grass terrace, broken by trees and palms of varying kinds, extends across one end upon which opens the loggia with its triple arches and low steps. An interesting wall of marble and open tile grillework separates this upper patio terrace from the lawn below. The several angles of the east side of the house, with its many arched and square-

High Walls Separate the Entrance Drive from the Patio of Dr. Kingsley's House

OLD TREES SHADE THE ENTRANCE DRIVE TO MR. MIZNER'S HOUSE



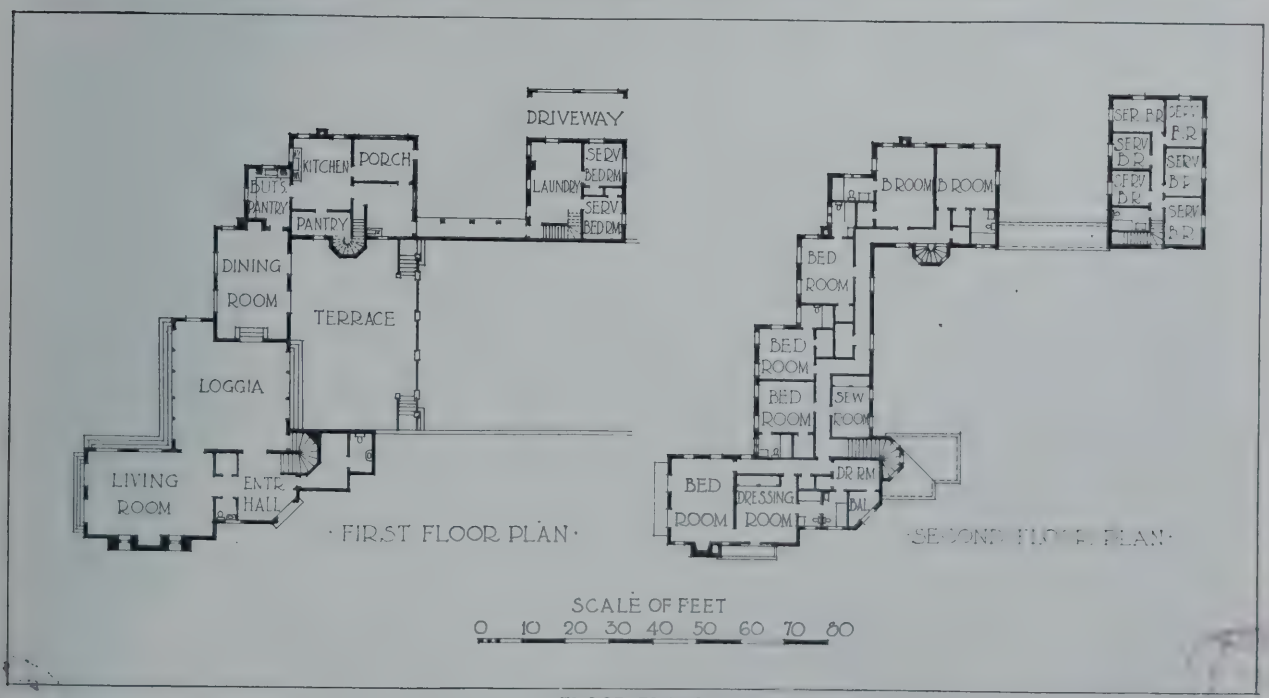
FLOOR PLANS

HOUSE OF ADDISON MIZNER, PALM BEACH

ADDISON MIZNER, ARCHITECT

BOSTON PUBLIC LIBRARY

SERVANTS' QUARTERS IN DR. KINGSLEY'S HOUSE OPEN ON A COURTYARD



FLOOR PLANS

HOUSE OF DR. W. S. KINGSLEY, PALM BEACH

ADDISON MIZNER, ARCHITECT

topped windows looking out upon the ocean, give opportunity for a pleasant play of alternating sunlight and shadow. The various breaks of this elevation also indicate and coincide with the plan of the interior, each bay representing a room. A few steps lead through a richly decorated entrance doorway into a corner hall from which winding stairs connect with the second floor. From this hall doors open into the living room and the great loggia room, 25 by 28 feet. From this room more steps lead up into the dining room and service wing, with its large pantry, kitchen and servants' hall. A covered walk 26 feet long connects the servants' hall with the service building, which contains besides a laundry and eight servants' rooms and bath, a large garage opening onto a lower level. A courtyard is formed by the service buildings and the covered walk, to which access is had through an archway in the servants' dormitory and laundry building. This isolation of the servants' quarters, always desirable where space and plan permit, recalls a similar arrangement found in most of the large Colonial mansions of the South, such as Mount Vernon, Westover and Homewood. The second floor of the main house contains seven master bedrooms, each having a separate bath and large clothes closet. Rough plaster walls, tile floors and narrow trim contribute to the severe simplicity of the interior of Dr. Kingsley's house. The walls of the loggia are laid up in stone, which treatment, together with the tiled floor and light wicker furniture, gives this connecting room the semblance of a porch. Curtained arches on the west lead out to the patio terrace and on the east to the ocean beach. The walls of the living room are paneled in wood, so divided that a number of old portraits could be set into some of the panels. The stone mantelpiece, which is more Italian than Spanish in design, shows a simple architecture and entablature of carved mouldings.

The main entrance of Mr. Mizner's own house, which together with a garage and two rooms and bath for servants is on a grade lower than the living rooms and patio, is approached by a shaded and winding drive. Trees of many kinds and picturesque shapes add greatly to the artistic effect. Stone stairs with iron rails lead from the entrance up to the loggia, and continue on to the dining room, which together with the service wing is on a still higher level. The two floors of the servants' building, which in this case is entirely detached, containing eight rooms and a bath, are reached by flights of steps, one up and one down from the level of the kitchen and servants' porch. Only the entrance bay of this interesting house is carried up an additional story, where two master rooms with baths are located. The patio, with its trees, marble benches, and plants in large Spanish pots, is very attractive, making a pleasant approach to the long flight of terraced steps leading down to a marble fountain.

In these two houses, although differing in plan and detail, Mr. Mizner has succeeded in reproducing much of the charm of the villas of southern Spain.

Dr. Kingsley's House Shows Many Angles and Windows on the Ocean Side

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

Use of Composite Columns in Concrete Buildings

By JOSEPH W. PARKER, *Consulting Engineer*

WITHIN recent years the designers of multiple-story buildings have found it advisable to adopt reinforced concrete construction to a greater extent than ever before and for much higher buildings than had previously been thought feasible or economical. The result is that today we have examples of reinforced concrete buildings which are 18 stories in height.

The gradual increase from year to year in the number of stories in buildings of this type introduced a very serious problem which had to be solved before this type of construction could be utilized to advantage in comparatively high buildings. The difficulty which arose was that of extremely large interior columns in the lower stories of a building when such columns were designed of reinforced concrete. The amount of floor space occupied by such interior columns in heavily loaded and high buildings, even when designed for a 1:1:2 concrete mix and heavily reinforced with spiral hooping and vertical rods, was so large as to be prohibitive, and it therefore became necessary to use some other type of column in such cases.

Structural Steel Columns Encased in Concrete

The type of column that was first used to effect the desired reduction in the sizes of interior columns was a structural steel column encased in a minimum amount of concrete for fire protection. This concrete as a rule had ordinary hooping with a few small vertical rods, and the entire column load was considered as carried by the structural steel column with a moderate increase in the maximum allowable working stresses in the steel column due to the stiffening effect of the concrete casing. The adoption of this type of column resulted in a considerable saving in valuable floor space in the lower stories of high buildings, but a serious objection to their use was the excessive increase in the cost of such columns over that of the spirally reinforced concrete columns with a rich mixture of concrete. This objection led to the use of the composite column consisting of a spirally reinforced column with a core of structural steel or cast iron.

Composite Columns with Structural Steel Core

This type of column consists of a reinforced concrete column with both spiral and vertical reinforcement, a rich mixture of concrete, and a core of structural steel. Sections of the various types of cores used are shown in Fig. 1. Type (c) is that most commonly used on account of the economy in the use of a single rolled section and also on account of the facility for making bracket connections, etc. to the core. Type (e), known as the Gray Column, is not suitable for use where beam and bracket connections are necessary.

An important advantage in the use of such columns is that the concrete inside the spiral hooping may be considered as carrying a portion of the total column load, and for that reason is more economical than the type described in the preceding paragraphs. The Joint Committee on Standard Specifications for Concrete and Reinforced Concrete in its Progress Report of 1921 suggests that the concrete within the spiral hooping of such columns be designed for a unit stress of 25 per cent of the ultimate strength in compression, and that the unit compressive stress in the steel section be determined by the formula $f_r = 18{,}000 - 70\frac{h}{R}$ where f_r = compressive unit stress in steel section with a max. value of 16,000 #/□"; R = least radius of gyration of steel section in inches; h = unsupported length of column in inches.

The Joint Committee further suggests that the safe load on a structural steel section which fully

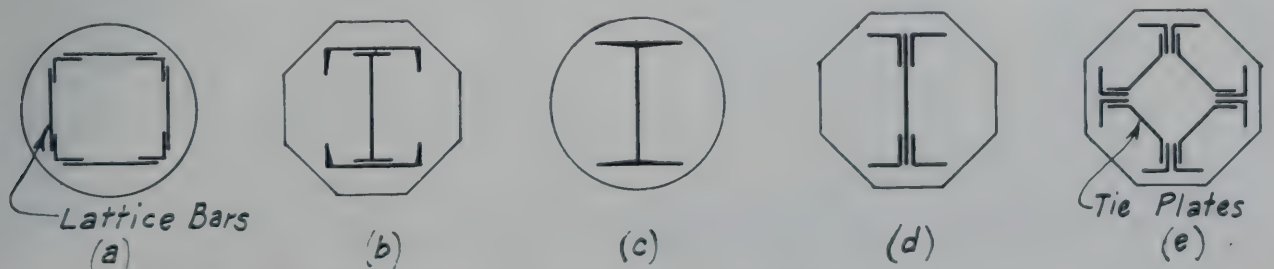


Fig. 1. Sections Showing Types of Steel Cores Used in Composite Columns

encloses or encases an area of concrete and which is protected by an outside shell of concrete at least 3 inches thick be calculated in the same way as for the columns just described, allowing 25 per cent of the ultimate strength in compression on the area of the concrete enclosed by the steel section. In such cases, however, the spiral hooping may be omitted and the outside shell simply reinforced by wire mesh or ordinary hooping weighing at least 0.2 pounds per square foot of surface of shell and with a minimum spacing of strands or hoops of 6 inches.

Composite Columns with Cast Iron Core

This type of column, commonly called the "Emperger Column" and named after the well known pioneer in concrete, Dr. F. Von Emperger, the inventor of hooped cast iron columns, consists of a reinforced concrete column with both spiral and vertical reinforcement, a rich mixture of concrete, and a core of cast iron. The section of the core is usually round with a shell of thickness from ¾ inch to about 2 inches, depending on the required capacity of the column. Here again the concrete inside the spiral may be considered as carrying a portion of the total column load and therefore is more economical than the structural steel column simply encased in concrete without spirals. The Joint Committee in its Progress Report of 1921 suggests that the concrete within the spiral core of such columns be designed for a unit stress of 25 per cent of the ultimate strength in compression, and that the unit compressive stress in the cast iron section be determined by the formula: $f_r = 12000 - \frac{60\ h}{R}$; where f_r = compressive unit stress in cast iron section with a max. value of 10,000 ♯ / □″; R = least radius of gyration of cast iron section in inches; h = unsupported length of column in inches.

The Joint Committee further suggests that the outside diameter of the cast iron core should not exceed one-half the diameter of the column within the spiral and that the spiral reinforcement be not less than 0.5 per cent of the volume of the column within the spiral. The American Concrete Institute in its "Standard Building Regulations for the Use of Reinforced Concrete," adopted in 1920, also recommends the use of the preceding formulæ and distribution of loads between concrete and core in the design of composite columns with either structural steel or cast iron cores.

Special Features of Design

In the design of high and heavily loaded reinforced concrete buildings, it is customary to use interior columns of spirally reinforced concrete for as many of the upper stories as possible. When the loads eventually become so large that it is no longer advisable, on account of excessive sizes of columns, to continue to use this type in the lower stories, some form of composite column is generally utilized. In order to make certain that the metal core receives the greater portion of the total column load it is advisable that metal brackets be attached to the core in every story. These brackets may be located just below the floor slabs and encased in the column capitals or they may be located just above the floor slabs and encased within the usual column casing. In the latter case the column casing is figured as carrying the floor load down to the bracket placed on the column just above the floor below. Fig. 2 illustrates the type of bracket which is placed just below the floor slab and is encased in the column capital. It consists of a steel bracket built up of angles and is riveted to the structural steel core. Fig. 3 illustrates the type of cap which is placed at the top of the structural steel core to carry the reinforced concrete column above as well as the floor slab at that level. It consists of a steel cap and brackets built up of plates and angles and is riveted to the top of the structural steel core. Figs. 2 and 3 are illustrations of details used in the construction of a large manufacturing building of reinforced concrete with brick veneer for the Gillette Safety Razor Co., South Boston, by Chas. T. Main, Engineer, of Boston.

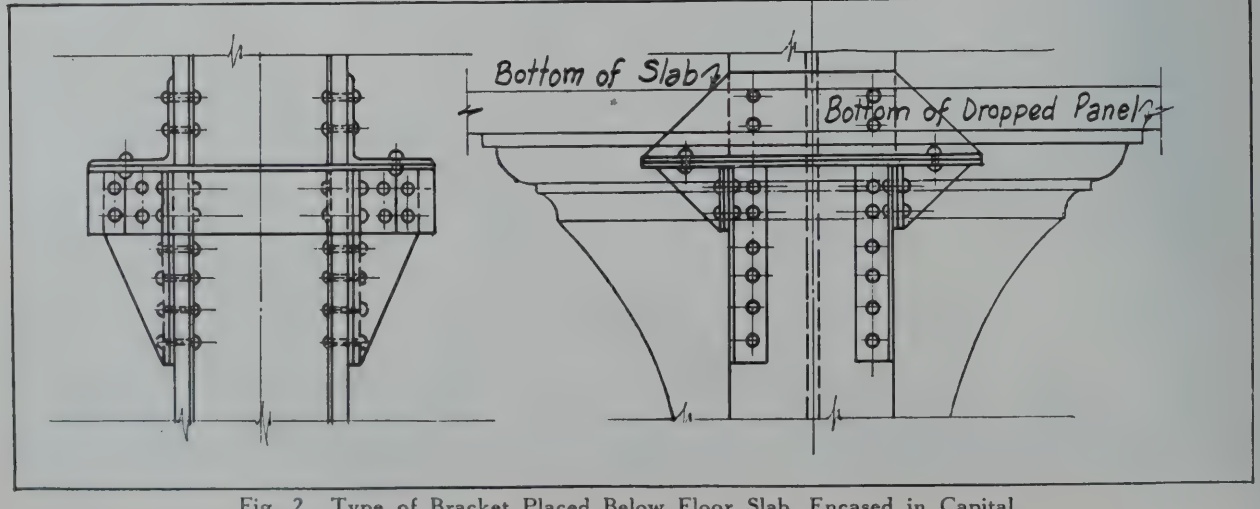


Fig. 2. Type of Bracket Placed Below Floor Slab, Encased in Capital

Where cast iron cores are used suitable brackets should be provided and the same outside diameter of core should be used in as many stories as possible in order to require the use of only a small number of reducing sleeves. At least 5 inches of concrete should be provided for outside the core at all points. In such columns it is also customary to fill the core with concrete of the same mixture as the casing.

Comparison of Types of Composite Columns

The composite column with the structural steel core is the most common type at the present time and will therefore be considered first. It is advantageous with respect to the type with cast iron core principally on account of the reliability of the material, the comparative ease of making satisfactory connections to it, and the facility for rapid erection. Its disadvantages as compared to the cast iron type are (1) that the structural steel core has a lower ultimate compressive strength than the cast iron core, and (2) that the high modulus of elasticity of structural steel will not permit as great a strength to be developed in combination with concrete as will the cast iron with its comparatively low modulus of elasticity. It is a well known fact that structural steel is a very reliable material of construction, and designers of buildings are likely to utilize it wherever it can be used to advantage. Little difficulty is experienced in making connections to it where necessary, and the splicing of one column section to another is a very simple matter.

Perhaps the best series of tests made in this country on composite columns with structural steel cores is that of Talbot and Lord described in Bulletin No. 56 of the Engineering Experiment Station at the University of Illinois. This series included 32 columns divided into four groups in this way: (1) plain steel columns; (2) core-type columns, i.e., columns in which the portion within the structural steel members was filled with concrete but without spiral reinforcement; (3) fireproofed columns, i.e., core-type columns having a 2-inch protective covering but with no spiral reinforcement; (4) spiral columns, i.e., core-type columns enclosed in close fitting spiral and filled with concrete to outer surface of spiral.

The core-type column proved to be very tough, and failure was slow. For short columns failure was caused in most cases by the crushing of the concrete; for longer columns failure was caused by bending and the crushing of the concrete. The effect of the concrete mix was small, because the strength of the column was governed by the steel rather than by the concrete. The determination of the proportion of load carried by the steel and the concrete was based upon the assumption that for a certain deformation in the core-type column, the steel core carried the same load as that carried by a plain steel column of the same section for the same deformation, and that the balance of the load in the core-type column was carried by the concrete. The fireproofed columns gave about the same results as the core-type columns.

The spiraled columns with structural steel cores showed considerably greater strength and toughness than similar columns without spiral reinforcing; in fact their ultimate strength exceeded the capacity of the testing machine at that time. On account of large deformation necessary the full strength afforded by spiral reinforcing is not available in building construction, and therefore a large percentage of spirals is not justifiable. In most cases 1 per cent of the volume of the enclosed concrete is ample and will provide for a tougher and safer column and also will prevent spalling of the outer shell. Since danger of sudden failure is removed, the results of these tests indicated that such columns may be designed for higher working loads than the fireproofed type of column. The steel cores used in these tests were the Gray type shown in Fig. 1 (e) and were made up of eight 3 x 2½ x 5/16-inch angles

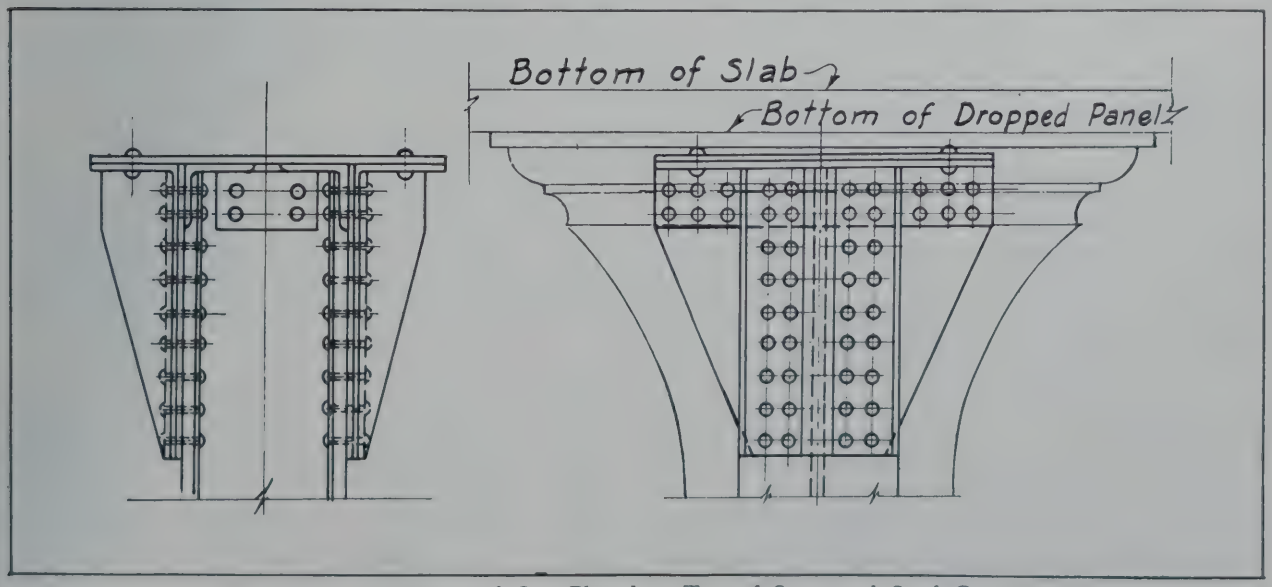


Fig. 3. The Type of Cap Placed at Top of Structural Steel Core

with 5½ x ¼-inch steel ties spaced about 16 inches on centers, the core being about 12 inches outside diameter.

The composite column with a cast iron core is a very economical column. It is theoretically a more suitable column than the type with a structural steel core, due to the much greater compressive strength of cast iron. When encased in concrete which is reinforced with longitudinal rods and spiral hooping it makes a very desirable column for heavy loads if the quality and uniformity of the cast iron core can be assured. The strength of cast iron is very uncertain in tension, and this type of column is intended to largely eliminate the possibility of tension in the cast iron, due to bending stresses in the column, by encasing the core with a liberal thickness of concrete well reinforced both vertically and spirally. This casing also serves as excellent fireproofing. L. J. Mensch in a paper on "Tests of Concrete Columns with Cast Iron Core" presented at the Thirteenth Annual Convention of the American Concrete Institute says: " . . . the combination of hooped concrete and cast iron makes it possible to develop the ultimate strength of both the hooped concrete and the high compressive strength of the cast iron." He further says in conclusion: "To sum up, we have in hooped concrete columns reinforced with cast iron, a new type of compression member which can sustain stresses up to 17,000 pounds per square inch, and hence allows smaller sizes than columns built of structural steel, at a very great saving in cost." A disadvantage in the use of this type of column, however, is the comparative unreliability of cast iron as a structural material. Flaws and blow holes are likely to be present in spite of thorough inspection. This type of column has been used principally in the Middle West. Fig. 4 shows a typical cross section of one of the composite columns with cast iron core which was tested by Mr. Mensch.

Advantage in Size Over Spiral Columns

That there is a reduction in the diameters of composite columns for a given loading as compared with spiral columns is evident from an examination of the tables given here. Table I gives the capacities of round concrete columns of various diameters with vertical and spiral reinforcement as based on the formula adopted by the Joint Committee in January, 1917. The concrete mix is 1 : 1 : 2, and the coarse aggregate is granite or trap rock. The spiral reinforcement is approximately 1 per cent of the volume of the enclosed concrete. Table II gives the capacities of round concrete columns with structural steel (H-section) cores and with spiral reinforcement as based on the formula suggested in the Progress Report of 1921 by the Joint Committee. The concrete mix is 1 : 1 : 2, and the coarse aggregate is granite or trap rock. The spiral reinforcement is approximately 1 per cent of the volume of the enclosed con-

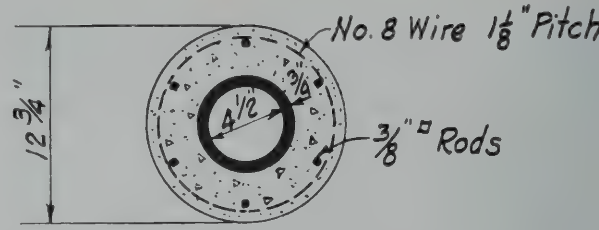


Fig. 4. Section of Composite Column; Cast Iron Core

crete. Table III gives the capacities of round concrete columns with round cast iron cores and with spiral reinforcement as based on the formula suggested in the Progress Report of 1921 by the Joint Committee. The concrete mix is 1 : 1 : 2, and the coarse aggregate is granite or trap rock. The spiral reinforcement is approximately 1 per cent of the volume of the enclosed concrete.

It is apparent that the reduction in size is much greater with a structural steel core than with one of cast iron. This is due to the comparatively low compressive stresses permitted in the formula used for the determination of the working stresses in the cast iron core. The results of the tests by Mr. Mensch seem to indicate that somewhat higher stresses might be safely used when a good quality of cast iron is secured and the core thoroughly encased in concrete.

In conclusion, it may be said that we have in composite columns a means of materially reducing the sizes of interior columns in the lower stories of high concrete buildings. That this is a matter of particular importance at the present time cannot be denied in view of the high rental values of floor space in modern buildings. The adoption of this type of column has made possible the utilization to good advantage of reinforced concrete construction in buildings to an extent once thought impractical.

Table I

Outside Dia.	Spirals Size	Spirals Pitch	Vert. Steel 4%	Safe Load
18 in.	5/16 in.	2 in.	7.08 sq. in.	277,000 lbs.
20 in.	⅜ in.	2½ in.	9.08 sq. in.	355,000 bls.
22 in.	⅜ in.	2¼ in.	11.36 sq. in.	444,000 lbs.
24 in.	⅜ in.	2 in.	13.84 sq. in.	542,000 lbs.
26 in.	7/16 in.	2½ in.	16.60 sq. in.	650,000 lbs.
28 in.	7/16 in.	2½ in.	19.60 sq. in.	767,000 lbs.

Table II

Outside Dia.	Spirals Size	Spirals Pitch	Structural Steel Core		Safe Load h = 12 ft.
18 in.	5/16 in.	2 in.	8 in. B.H.	91.0 lbs.	480,000 lbs.
20 in.	⅜ in.	2½ in.	10 in. B.H.	136.5 lbs.	725,000 lbs.
22 in.	⅜ in.	2¼ in.	12 in. B.H.	133.5 lbs.	778,000 lbs.
24 in.	⅜ in.	2 in.	12 in. B.H.	190.0 lbs.	1,070,000 lbs.
26 in.	7/16 in.	2½ in.	14 in. B.H.	245.5 lbs.	1,383,000 lbs.
28 in.	7/16 in.	2½ in.	14 in. B.H.	288.5 lbs.	1,630,000 lbs.

Table III

Outside Dia.	Spirals Size	Spirals Pitch	Cast Iron Core Outer Dia.	Cast Iron Core Thickness	Safe Load h = 12 ft.
18 in.	5/16 in.	2 in.	7 in.	1¼ in.	303,000 lbs.
20 in.	⅜ in.	2½ in.	8 in.	1¼ in.	389,000 lbs.
22 in.	⅜ in.	2¼ in.	9 in.	1½ in.	516,000 lbs.
24 in.	⅜ in.	2 in.	10 in.	1¾ in.	661,000 lbs.
26 in.	7/16 in.	2½ in.	11 in.	2 in.	822,000 lbs.
28 in.	7/16 in.	2½ in.	12 in.	2 in.	956,000 lbs.

Note.—Cast iron cores filled with 1:1:2 concrete.

DECORATION & FURNITURE

Details of the Large Hall Chateau de Montfermeil, Paris

CLASSIC INFLUENCE IN LOUIS XIV INTERIORS

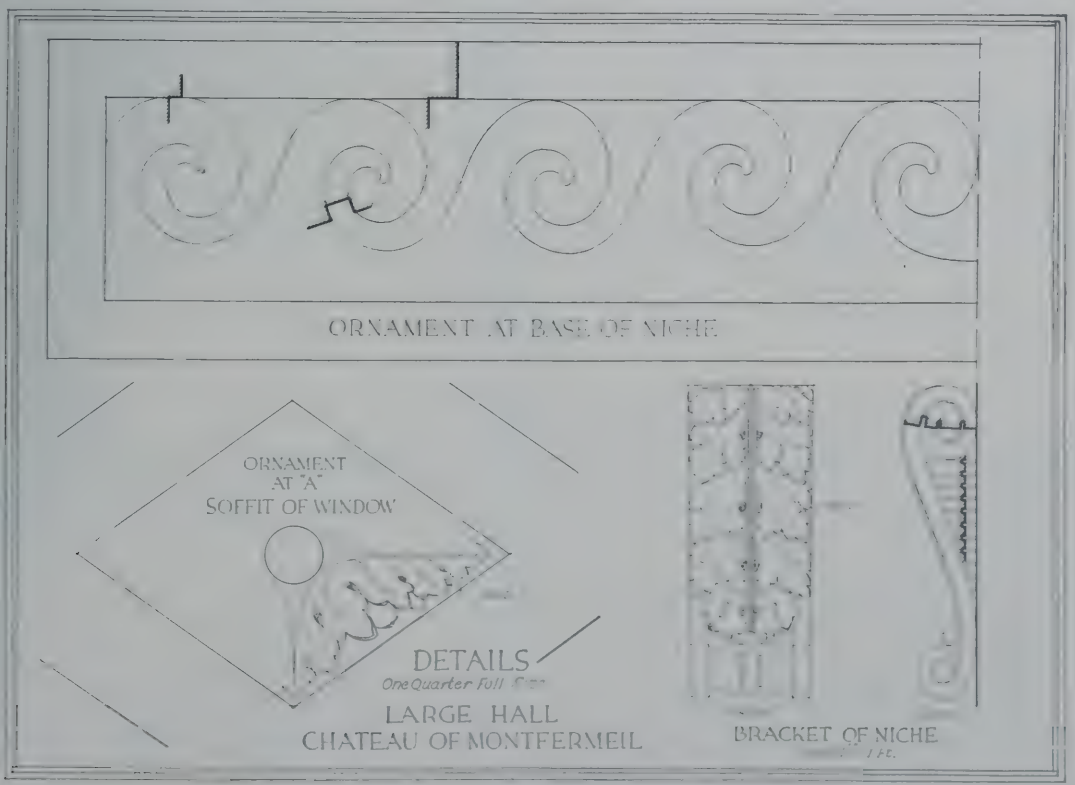
Drawn by C. HAMILTON PRESTON

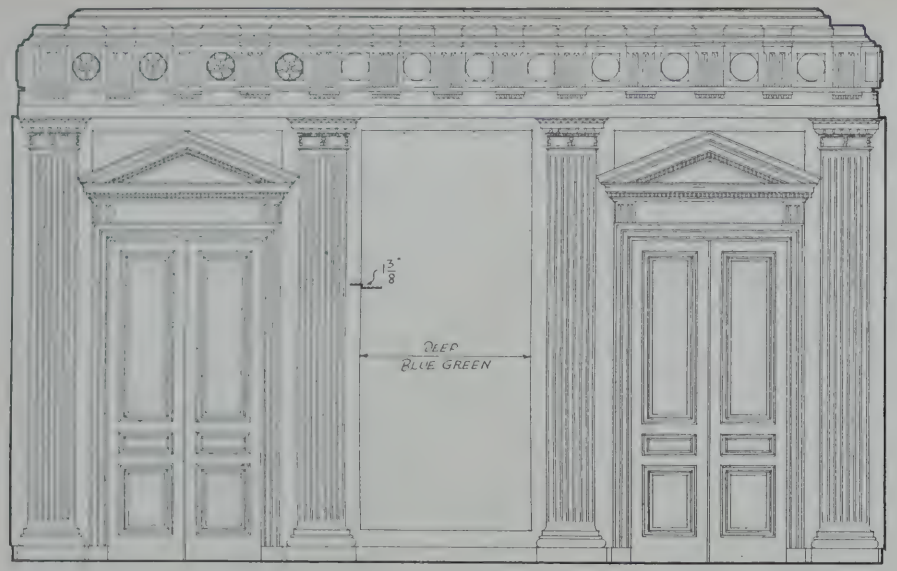
THE large hall in the Chateau de Montfermeil, even more than the two salons, shows the influence of Classic architecture. In this room of perfect proportions, 24 feet, 3 inches wide by 38 feet, 3 inches long and 17 feet high, a balanced design is carried out by means of fluted pilasters, richly ornamented entablature, splendid doorways, and graceful wall niches. Of the long walls of the room, which runs north and south, the east wall shows three casement windows, that in the middle extending to the floor, each separated by double pilasters so spaced that they divide the wall into three major parts, each containing a window opening; the west wall shows a similar grouping of pilasters, forming three wall spaces, in which two niches and a center doorway balance the window openings opposite. The north and south elevations are likewise divided, but by single instead of double pilasters.

Unusual care was taken in the detail, which shows great refinement and delicacy, not only in the mouldings of the architraves and pediments of the doorways and niches but also in the carved Tuscan caps of the pilasters and the Classic entablature, richly ornamented with triglyphs and metopes in which are carved rosettes. Combined with this beauty of detail is a consideration for scale and proportion which makes this room one of the superb examples of interior architecture designed during the Louis XIV period. So Classic in feeling is the detail that it might well have been copied from some room in one of the Roman palaces of the Italian Renaissance.

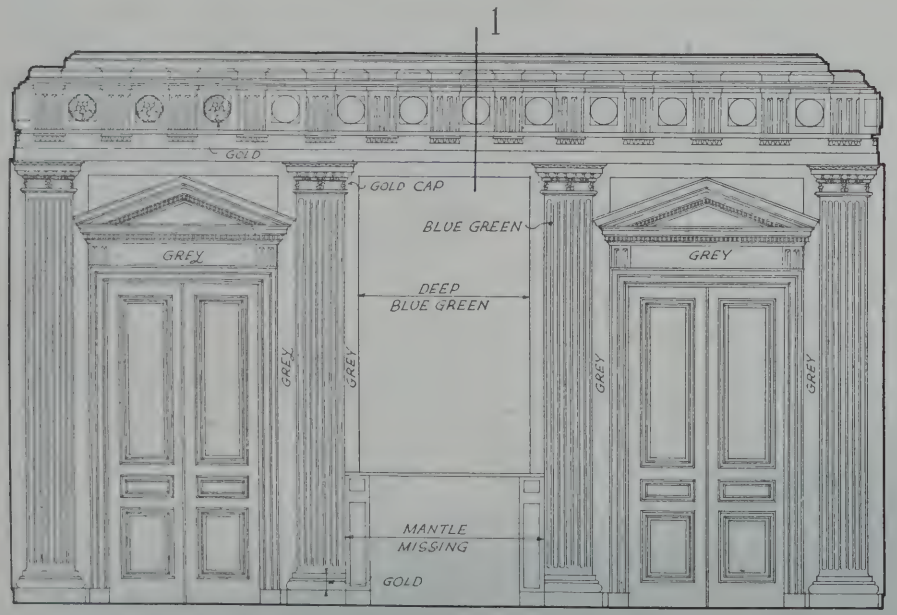
The architecture of this hall is splendidly decorated with color, offset by the deep brown tones of the parquetry floor. The general color throughout is gray, relieved by deep blue-green in the pilasters and end wall panels, with gold used to enrich the bases and caps of the pilasters and the brackets and rosettes of the entablature.

This use of color with gold should serve as an inspiration to modern designers who appreciate and understand the importance and value of color in interior decoration and architectural ornament.

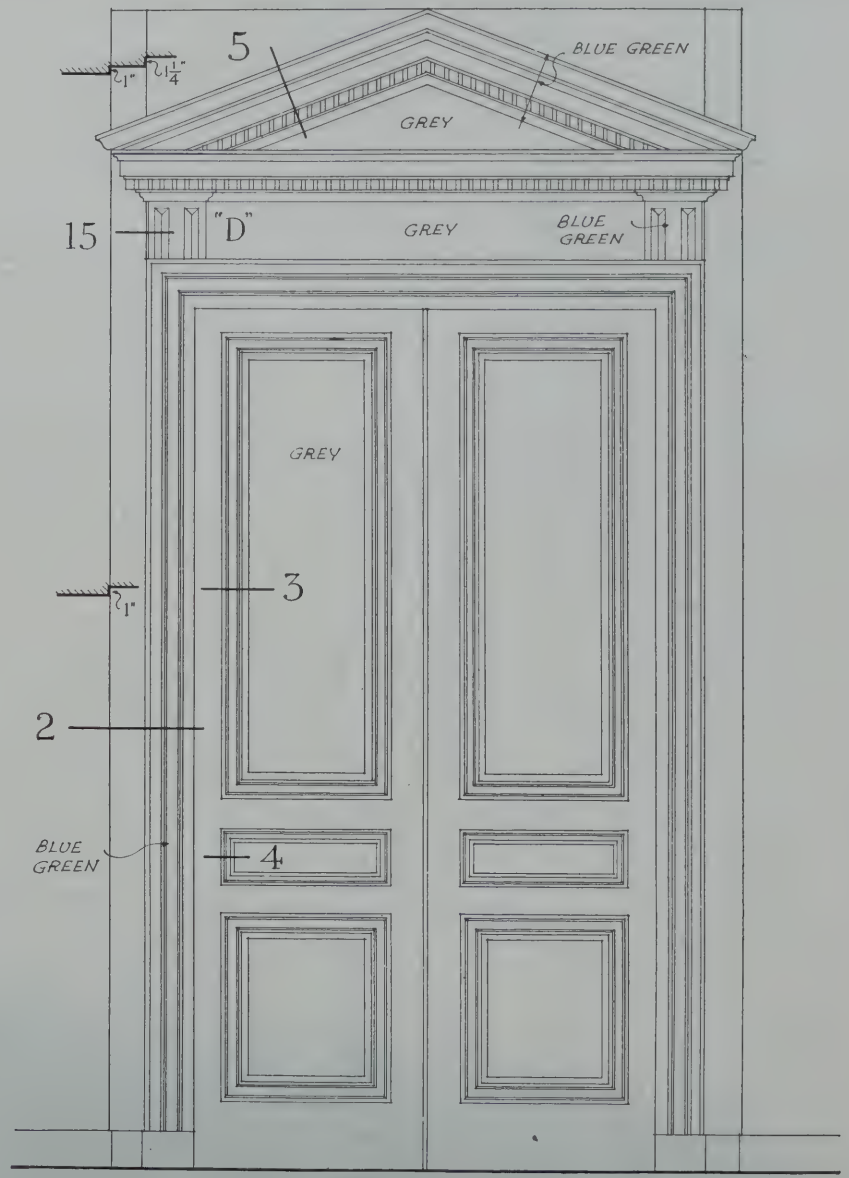




NORTH ELEVATION



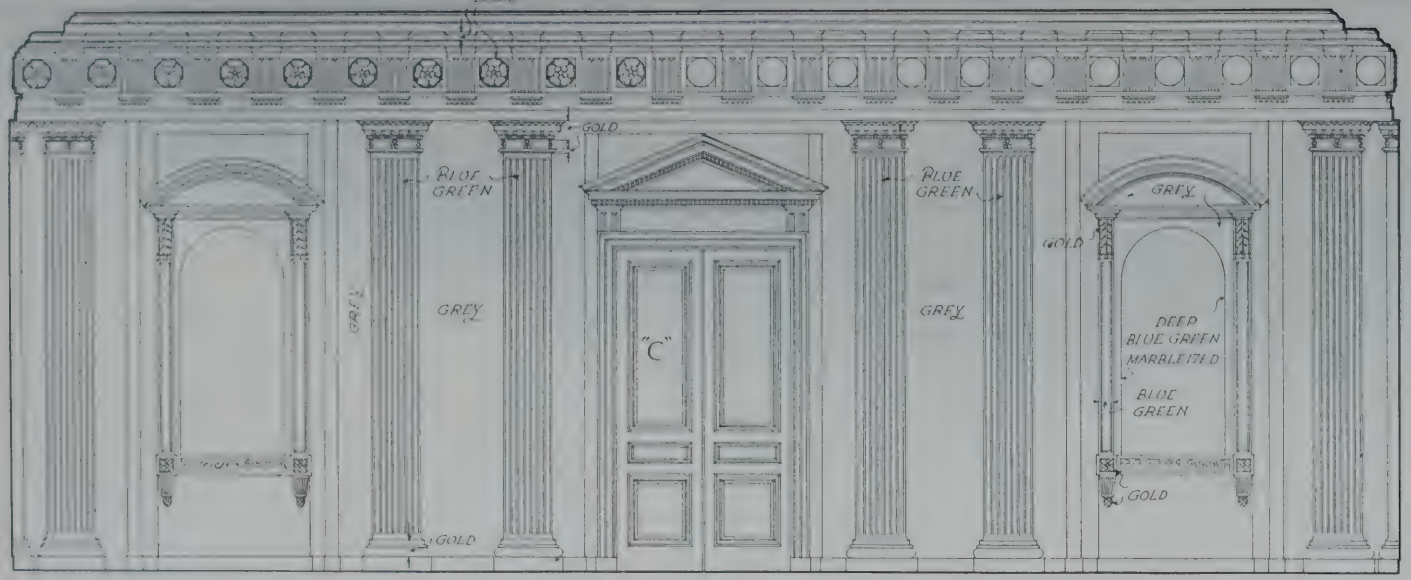
SOUTH ELEVATION
Scale 3/16" = 1 Foot



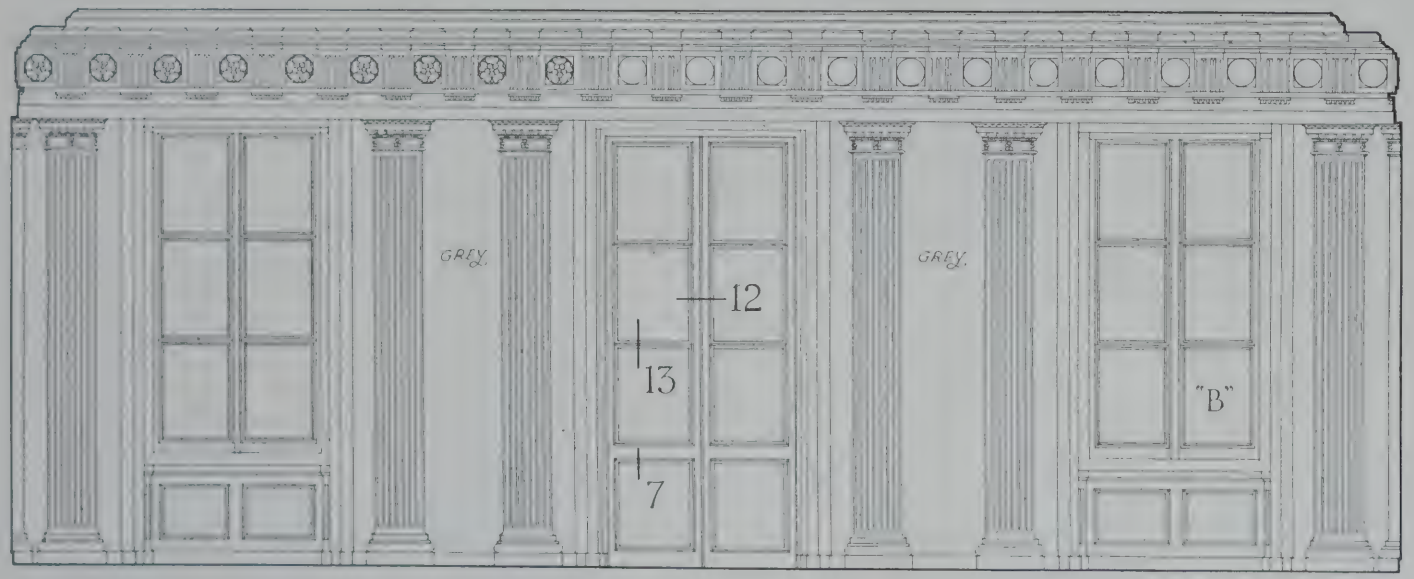
ELEVATION OF DOOR "C"
Scale 1/2" = 1 Foot

LARGE HALL CHATEAU OF MONTFERMEIL

BOSTON PUBLIC LIBRARY



WEST ELEVATION

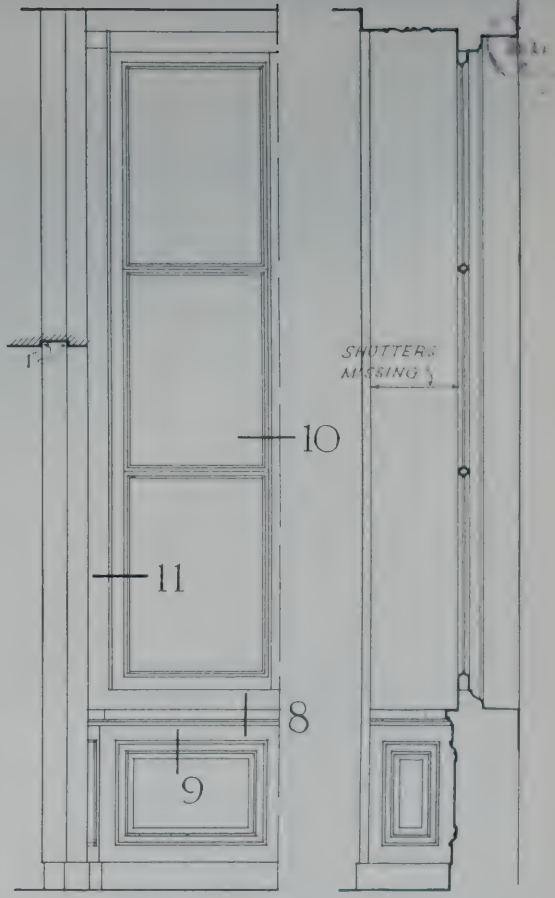


EAST ELEVATION

LARGE HALL

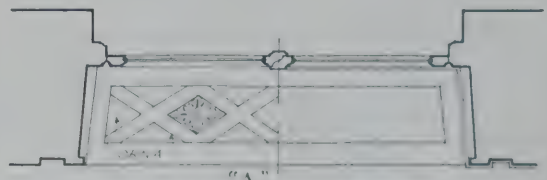
CHATEAU OF MONTFERMEIL

Scale 3/16" = 1 Foot



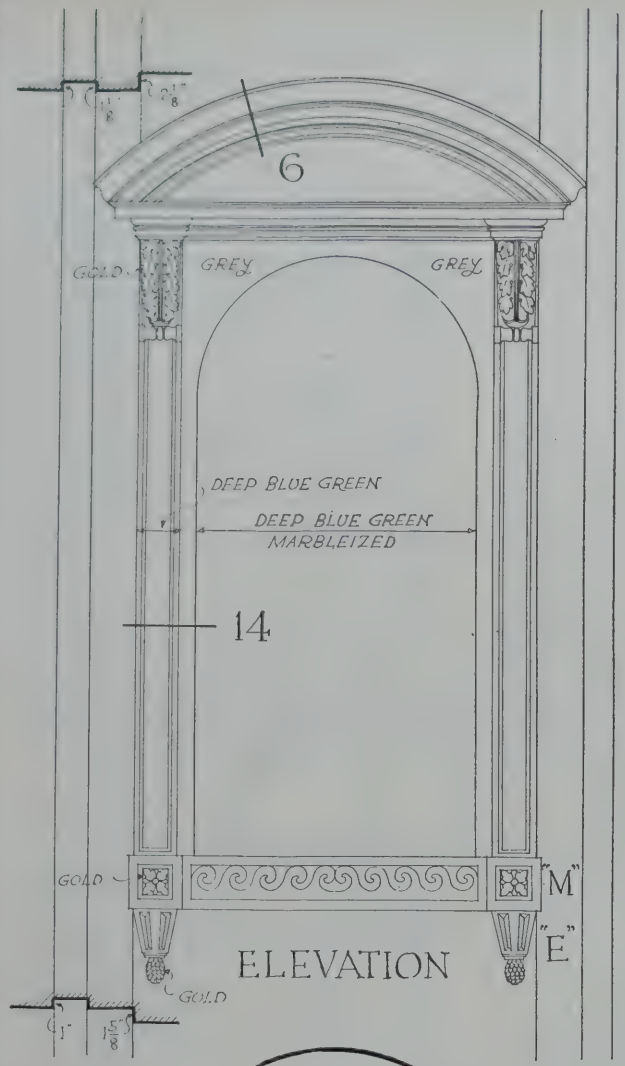
1/2 ELEVATION OF WINDOW AT 'B'

SECTION Scale 3/8" = 1 Foot

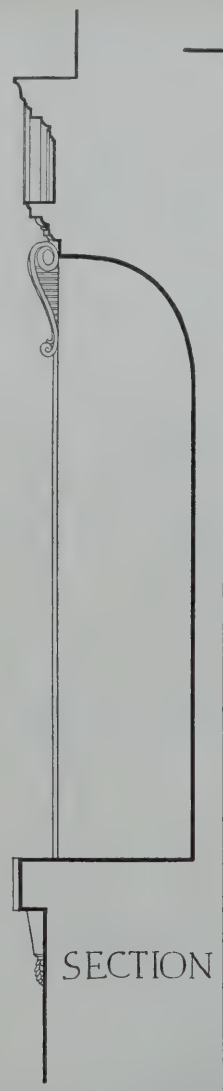


SOFFIT FLOOR

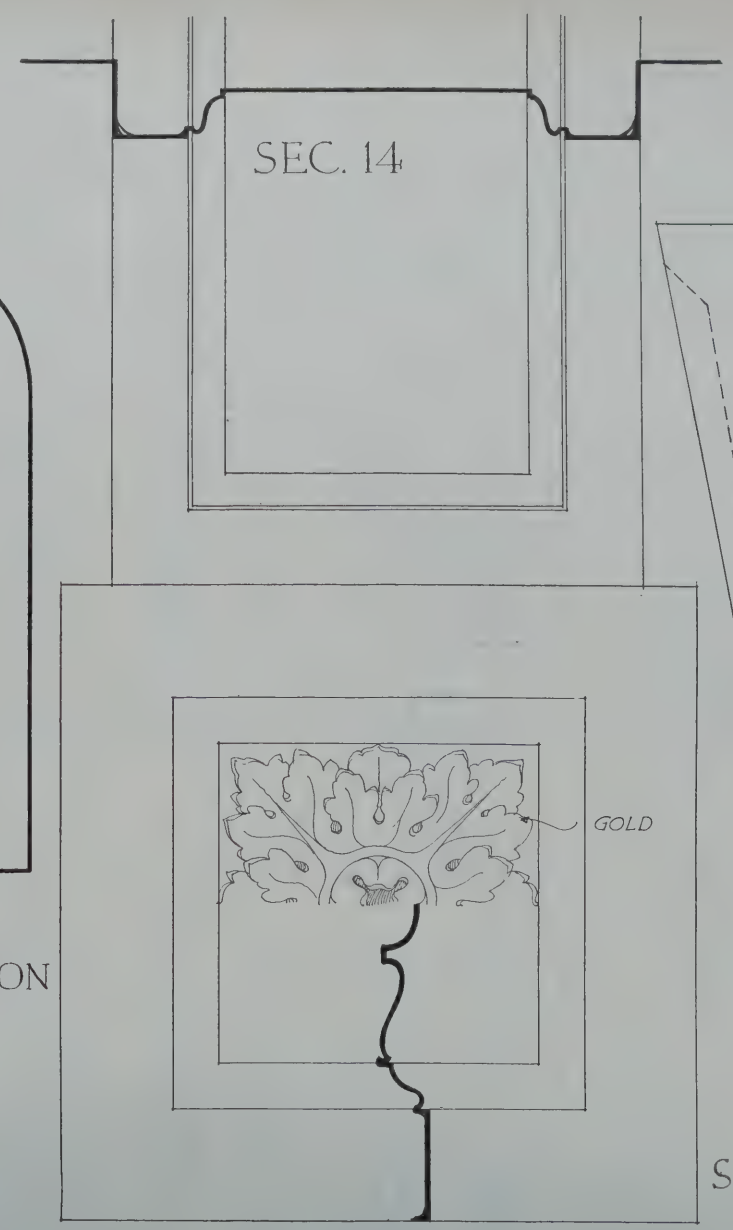
PLAN



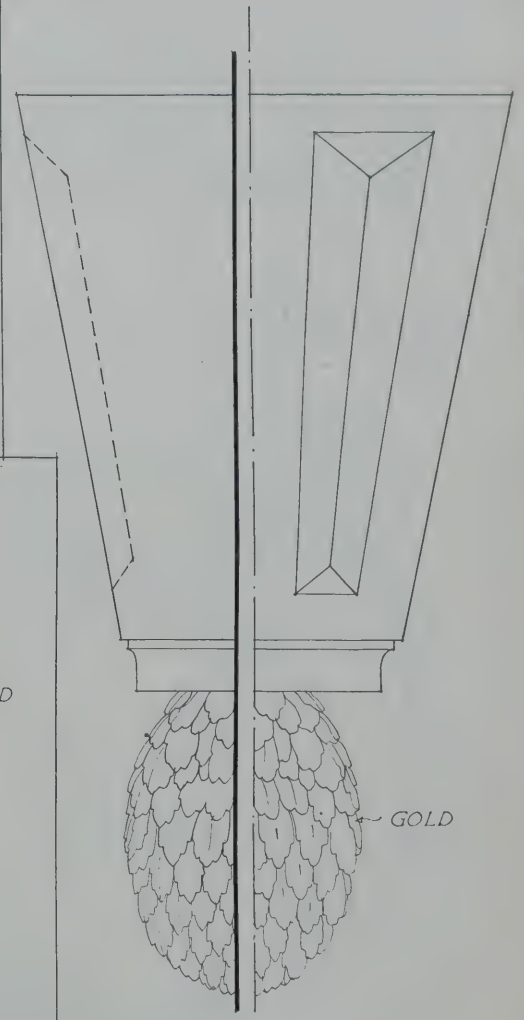
ELEVATION



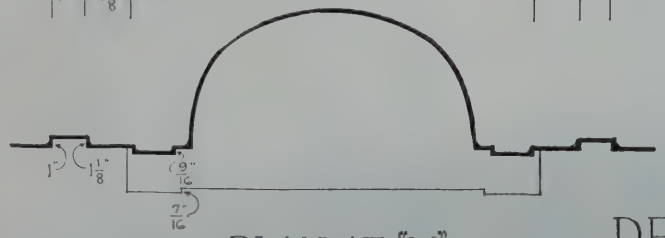
SECTION



DETAIL AT "M" *Full Size*



SECTION $\frac{1}{2}$ ELEVATION AT "E"

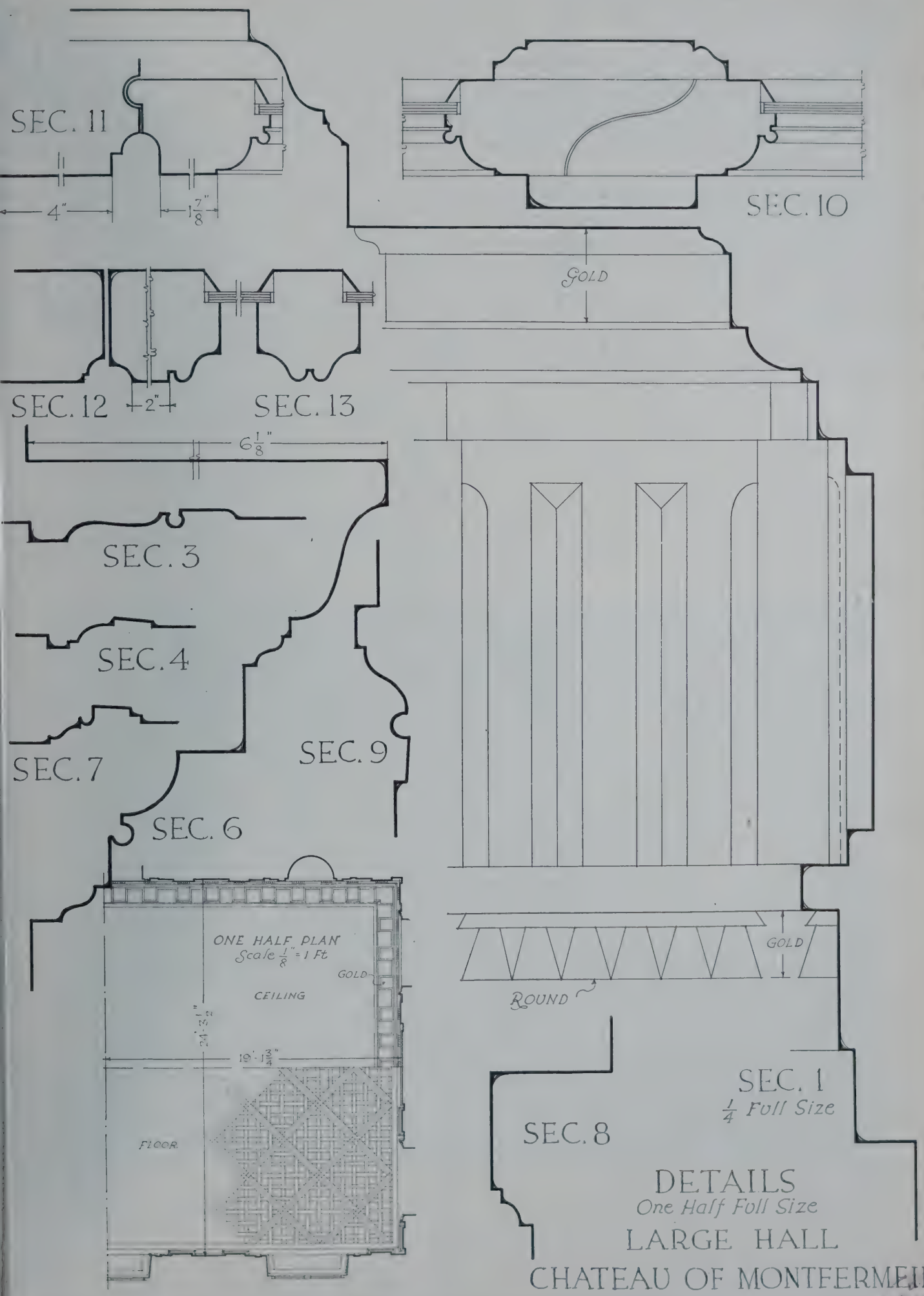


PLAN AT "M"
Scale $\frac{1}{2}$"=1 Ft

DETAILS
One Half Full Size

LARGE HALL
CHATEAU OF MONTFERMEIL

BOST PUBL LIBRA

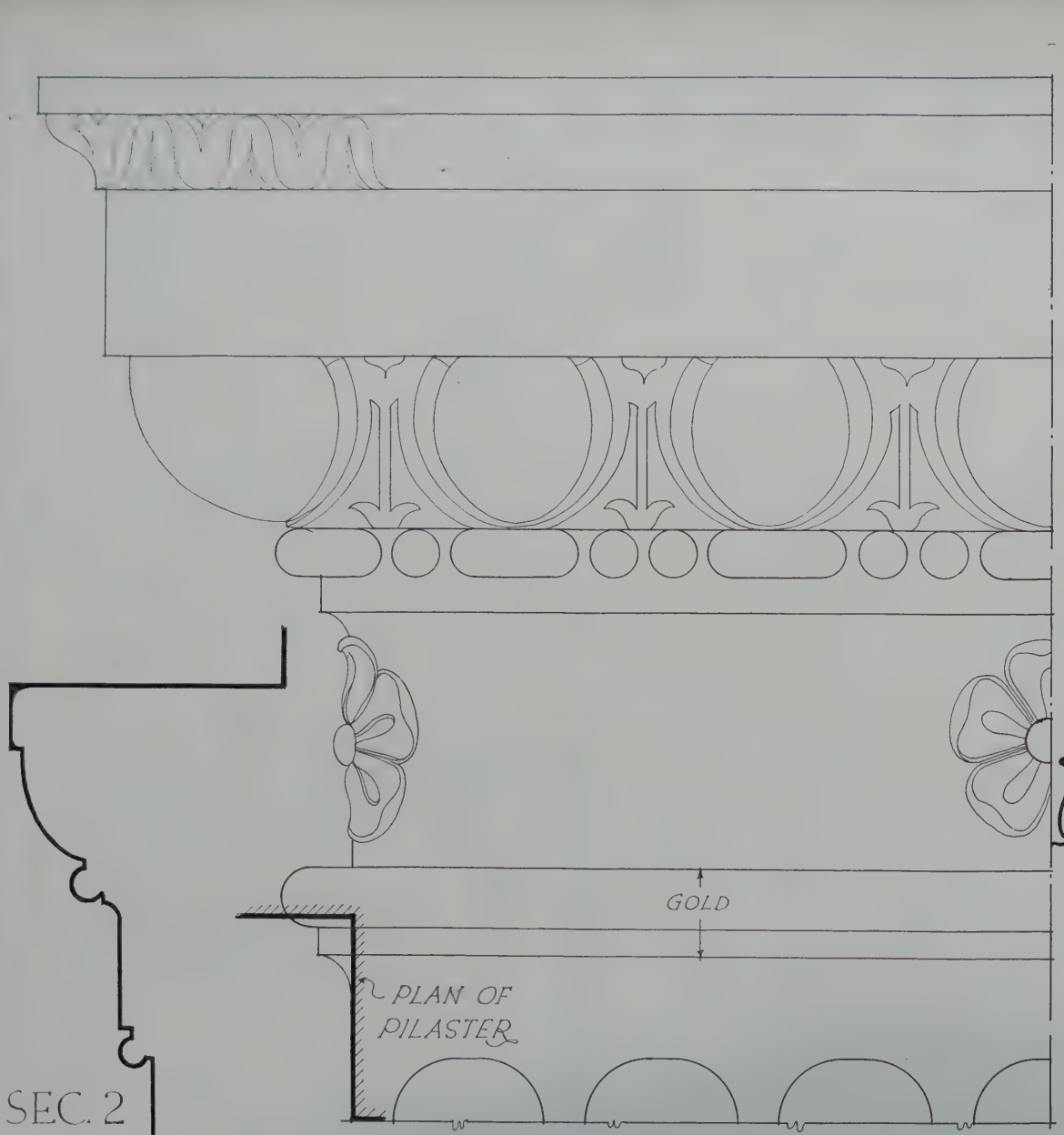


DETAILS

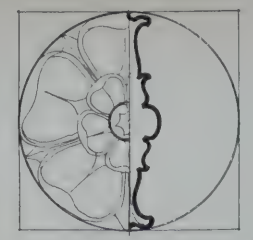
One Half Full Size

LARGE HALL

CHATEAU OF MONTFERMEIL



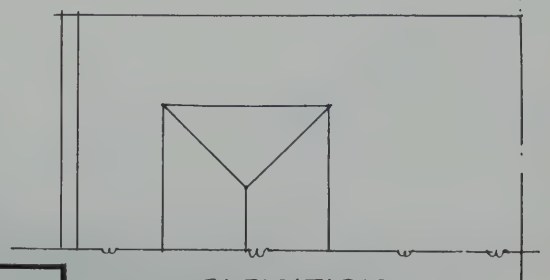
SEC. 2



DETAIL OF ROSETTE
IN CORNICE
Scale $1\frac{1}{2}$" = 1 Ft

PROFILE OF
PILASTER BASE

SEC. 5



ELEVATION

SEC. 15

DETAILS

One Half Full Size

LARGE HALL

CHATEAU OF MONTFERMEIL

LIBRARY

Plate Description

St. Paul's Church, Newburyport, Mass., Plates 29, 30. Perry, Shaw & Hepburn, Architects; Office of R. Clipston Sturgis, Consulting Architect.

Shut in by a wall, with a century-old graveyard on one side, this stone church in simple Colonial style defies the casual observer to say whether it is new or old. Built of irregular shaped blocks of West Townsend granite laid up random, the exterior design shows the severe restraint and dignity characteristic of the early New England meeting-house. The unusual care taken in the size and scale of the window openings and their relation to the wall surfaces, as well as the accuracy and good taste displayed in the use of Colonial detail, contributes to this building's appearance of age, and makes it difficult to believe that it replaces one of wood built in 1810, destroyed by fire in 1921.

The interior, which is finished in plaster with wooden trim, columns and entablature painted white, has old fashioned box pews with doors, mahogany rails and book racks. The tall, slender columns, which support the end balcony and form two side aisles, the high wall panels and pilasters, the wide entablature with delicate mouldings and the flat paneled ceiling above a lofty cove, all give great dignity to the interior. The octagonal pulpit with its massive but graceful canopy, and the pedestal of delicate design which supports the lectern book rest—a bronze eagle of beautiful modeling—are excellent examples of the logical use of Colonial detail.

Third District Court House, New York. Plates 31, 32. Alfred Hopkins, Architect.

For civic buildings there is no style of architecture better adapted or more appropriate than the Florentine phase of the Italian Renaissance, in which the new Magistrates' Court House of the Third District has been designed. The plans show three floors and a mezzanine. The basement is devoted to boiler room and storage space. Besides the entrance lobby and stairway, the first floor contains a complaint room, and a police department with 15 cells of which 9 are on the mezzanine floor. A large courtroom occupies the greater part of the third or top floor. The exterior is built entirely of brick in the Italian style, showing interesting use of moulded brick in the architraves of the arched entrance door and upper windows. Bronze lanterns and door grille add to the decorative effect of the entrance. The interior shows a successful and consistent use of this same style in both architectural details and furnishings, unusual and satisfying.

Magistrates' Court Room—Third District Court, New York
Alfred Hopkins, Architect

EDITORIAL COMMENT

THE HOUSING PROBLEM

IT is not only the housing of the well-to-do, so attractively and successfully demonstrated by Andrew J. Thomas, Architect, in the garden apartments of Jackson Heights, but also the more important problem of housing the wage earner at a minimum cost in light, airy, modern apartments which is engaging public attention.

The seriousness of this problem locally can be appreciated when it is realized that New York is 16 years behind in the building of homes for working men. To alleviate this unfortunate situation, individuals, corporations, legislative committees and newspapers have instituted investigations to secure reliable information to bring to the attention of the city government as well as the public, information showing a practical way in which the existing inadequate and deplorable housing conditions may be remedied. That there is a practical way out of the present situation has been demonstrated to the satisfaction of the Lockwood Committee of the New York Legislature, as well as investing companies such as the Metropolitan Life Insurance Company. This company has just completed the construction in Long Island City, on three different sites, of altogether 54 houses, which will accommodate 2,125 families, or about 9,000 persons, from designs prepared by Andrew J. Thomas and D. Everett Waid, associated architects.

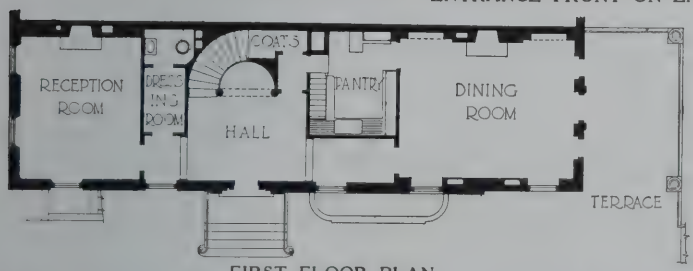
It was the opinion of many builders, real estate operators and owners that houses could not be built, under ruling prices for labor and material, to rent for rates lower than $20 per room with any profit to the builder or owner of the property—a rental entirely prohibitive to a very large proportion of the city dwellers, resulting in the inevitable crowding of two or three families into rooms intended for one family, the evil effect of which needs no argument, but does require a speedy and permanent remedy. The tragedy created by such crowded conditions can hardly be conceived by anyone unfamiliar with the situation in New York, where about 90 per cent of the people are obliged to live in multi-family houses, where there are no vacancies, and where consequently the landlords not only double and quadruple the rents, but also give as little service as possible. At last the worm has turned; the long suffering renters, by coöperative effort through tenants' associations, are combating the extortions of the landlords in the state legislature, where laws to protect tenants and to encourage the erection of houses in which the maximum rental can be $9 per room per month, have recently been enacted. The Metropolitan Life Insurance Company, under the able and experienced leadership of Mr. Thomas and Mr. Waid, agreed to build such houses after the estimates on the submitted plans satisfied them that the rental of $9 per room would produce on the actual cost of land and buildings a net return of 6 per cent, and 2 or 3 per cent more to amortize the cost of the houses.

The plans for all the houses except eight provide on each floor two apartments of three rooms and dining alcove, four apartments of four rooms and dining alcove, and two apartments of five rooms. For the complete bathroom in each apartment, for steam heat, hot water and janitor service, no charge is made. All apartments have electric light and gas facilities, which are paid for by the tenants. Between the houses, which are five stories in height, are courts or side yards 12 to 16 feet wide running from street to rear yard. The U-shaped plan of each house with open rear permits a large yard between the two wings from 36 to 42 feet in width by about 60 feet deep. The central yard, running the entire length of the block, is from 26 to 36 feet in width. There is abundant open space surrounding every house, so that perfect light and ventilation and greater safety from fire, as well as no dark inside rooms are assured. The four stairwells and stairways in each building, lighted by outside windows on each floor, are fireproof, as are also the self-closing doors to all apartments. Every apartment has access to a fire escape, none of which is on the front. The houses are therefore as safe from fire as it is possible to make buildings in which floors and partitions are of wood and plaster construction.

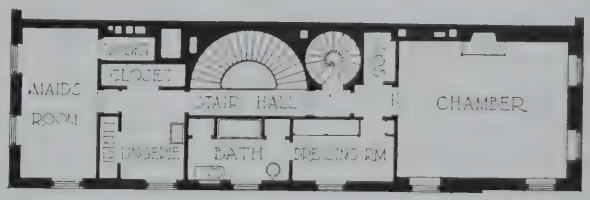
Every possible economy in construction was resorted to, such as importing from Holland, at a saving of $8 to $10 per thousand, the 14,000,000 face brick needed, and bringing by steamer from the Pacific Coast, already cut to proper lengths, 5,600,000 of the 32,000,000 feet of lumber required, producing a saving for the owners of at least $1,000 per house.

The lesson to be derived from this successful experiment seems obvious. Although it is doubtful if 8 per cent net on cost could be realized without the present tax-exemption, which expires January 1, 1932, at a rental of $9 per room per month, there is no doubt that an additional rent of $1.50 per month per room would sufficiently provide for full taxes. If, therefore, limited dividend corporations, other life insurance companies and employers of labor desiring to build apartment houses at the present possible rent, with a sure return of say 8 per cent would use the same methods as the Metropolitan Company has used in this operation, there seems to be no doubt that a maximum rental of $10 to $11 per room per month will produce 8 per cent net and pay full taxes, if the houses are built on low priced land, easily and cheaply prepared for building and with public utilities already provided.

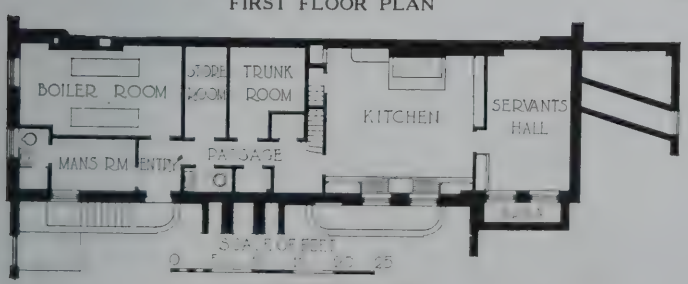
ENTRANCE FRONT ON EAST 57TH STREET



FIRST FLOOR PLAN



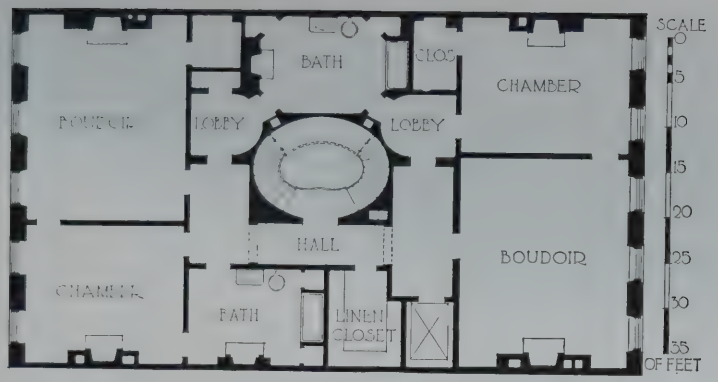
THIRD FLOOR PLAN



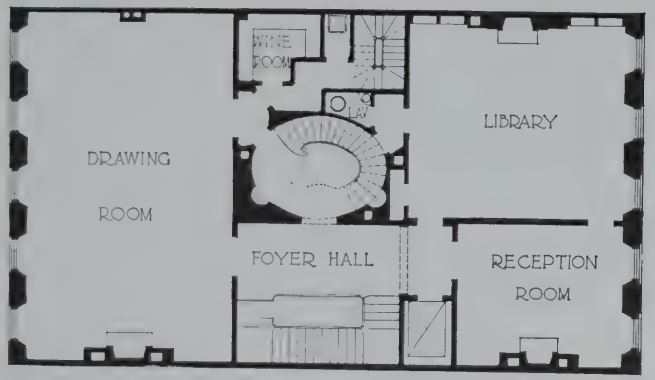
BASEMENT PLAN

SECOND FLOOR PLAN

HOUSE OF MRS. W. K. VANDERBILT, NEW YORK
MOTT B. SCHMIDT, ARCHITECT



THIRD FLOOR PLAN



SECOND FLOOR PLAN

FIRST FLOOR PLAN

GARDEN FRONT WITH ENTRANCE ON TERRACE

HOUSE OF MISS ANNE MORGAN, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

PAINTED DECORATION ADORNS THE WALL OF THE STAIRWAY

STEPS LEAD FROM HALL TO DINING ROOM DOOR

HOUSE OF MRS. W. K. VANDERBILT, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

Photos, Kenneth Clark

ANTIQUE PAINTED DOOR FROM HALL TO DINING ROOM

FIREPLACE AND OVERMANTEL DECORATION IN DINING ROOM

HOUSE OF MRS. W. K. VANDERBILT, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

EAST FRONT WITH TERRACE AND GARDEN GATE
HOUSE OF MRS. W. K. VANDERBILT, NEW YORK
MOTT B. SCHMIDT, ARCHITECT

COLONIAL SIMPLICITY AND DIGNITY MARK THE DINING ROOM

GLASS CLOSETS FLANK THE FIREPLACE IN THE WEST BOUDOIR

HOUSE OF MISS ANNE MORGAN, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

RECEPTION ROOM HAS CHINESE CHIPPENDALE WALL PAPER AND MIRROR

COMFORTABLE CORNER IN THE LIBRARY SHOWING BOOKCASE

HOUSE OF MISS ANNE MORGAN, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

WOODWORK FROM AN OLD ENGLISH ROOM ADDS INTEREST TO THE LIBRARY

OLD GEORGIAN PANELING IS USED IN MISS MORGAN'S OFFICE

HOUSE OF MISS ANNE MORGAN, NEW YORK

MOTT B. SCHMIDT, ARCHITECT

TREES GIVE A PICTURESQUE QUALITY TO THE EASTERN SIDE OF THE HOUSE

THE PATIO AND TERRACED GARDEN HAVE THE APPEARANCE OF AGE

HOUSE AT PALM BEACH

ADDISON MIZNER, ARCHITECT AND OWNER

Photos, F. E. Geisler Studio

A LARGE FIREPLACE DOMINATES ONE END OF THE LIVING ROOM

THE DINING ROOM HAS THE CHARM AND ATMOSPHERE OF SPAIN

HOUSE AT PALM BEACH

ADDISON MIZNER, ARCHITECT AND OWNER

WINDING DRIVES LEAD TO THE ENTRANCE DOOR

HIGH WALLS ENCLOSE THE PATIO ON THE UPPER TERRACE

HOUSE OF DR. W. S. KINGSLEY, PALM BEACH

ADDISON MIZNER, ARCHITECT

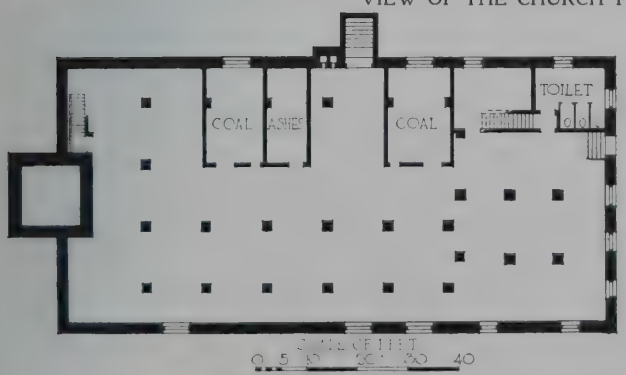
THE LOGGIA IS SPACIOUS AND AIRY

THE DINING ROOM, LIKE THE LOGGIA BEYOND, HAS A TILE FLOOR

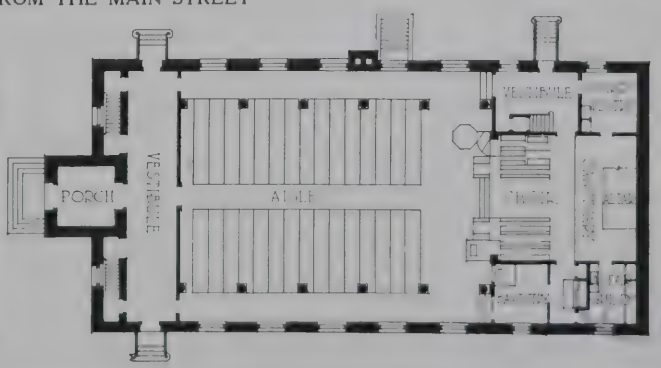
HOUSE OF DR. W. S. KINGSLEY, PALM BEACH

ADDISON MIZNER, ARCHITECT

VIEW OF THE CHURCH FROM THE MAIN STREET



BASEMENT PLAN



MAIN FLOOR PLAN

ST. PAUL'S CHURCH, NEWBURYPORT, MASS.

PERRY, SHAW & HEPBURN, ARCHITECTS; OFFICE OF R. CLIPSTON STURGIS, CONSULTING ARCHITECT

SIDE AISLE LOOKING TOWARD THE ENTRANCE

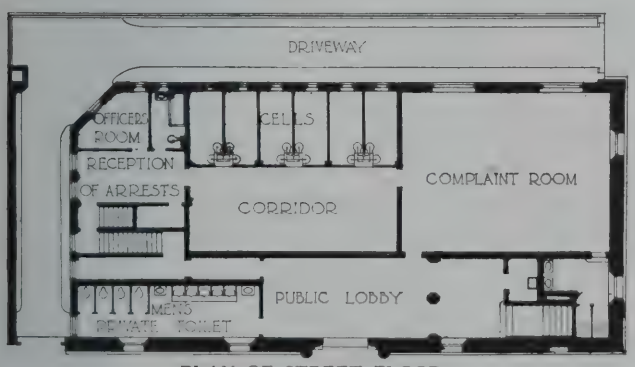
MAIN ENTRANCE DOOR

ST. PAUL'S CHURCH, NEWBURYPORT, MASS.

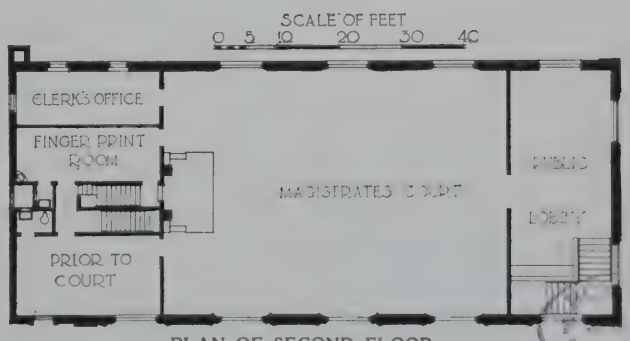
Photos, Paul J. Weber

PERRY, SHAW & HEPBURN, ARCHITECTS; OFFICE OF R. CLIPSTON STURGIS, CONSULTING ARCHITECT

MAIN FRONT ON SECOND STREET



PLAN OF STREET FLOOR



PLAN OF SECOND FLOOR

THIRD DISTRICT COURT, SECOND AVENUE AND SECOND STREET, NEW YORK

ALFRED HOPKINS, ARCHITECT

MAIN ENTRANCE ON SECOND STREET

MAGISTRATE'S DESK IN THE COURT ROOM

THIRD DISTRICT COURT, SECOND AVENUE AND SECOND STREET, NEW YORK

ALFRED HOPKINS, ARCHITECT

Photos, John Wallace Gillies

THE ARCHITECTURAL FORUM

SEPTEMBER 1924

OFFICE BUILDING REFERENCE NUMBER

PRICE $2

QVALITY LEAVES ITS IMPRINT

Standard Elevator Door Hardware *for the* Standard Oil Building

R-W IDEAL Elevator Door Hardware Is the Recognized Standard

The Standard Oil Company's new office building in New York City stands as a monument to the wisdom of standardization. Standardized business methods, combined with the use of standardized equipment have been largely responsible for this company's success. Hence it's not surprising that R-W IDEAL Elevator Door Hardware—the standard of America—was selected for use in its building.

Positive safety, assured silence of operation and the ability to withstand gruelling service have made R-W IDEAL Elevator Door Hardware the choice of the country's foremost architects. The complete line includes automatic door controllers and checks, and hangers for single-speed, two-speed and three-speed doors; for doors in pairs, operating from both sides, and for combination swing out doors.

Also exclusive manufacturers of Slidetite Garage Door Hardware, AiR-Way Multifold Window Hardware and other nationally-advertised items of builders' hardware.

Write today for our time-saving detail folio, from which actual blueprints of elevator door installations can quickly and easily be made, as well as for Catalog F-21.

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(609)

The ARCHITECTURAL FORUM

VOLUME XLI — NUMBER 3

CONTENTS for SEPTEMBER 1924

OFFICE BUILDING REFERENCE NUMBER

PLATE ILLUSTRATIONS	Architect	Plate
Standard Oil Building, San Francisco	*George W. Kelham*	33, 34
Bank of Italy Building, Los Angeles	*Morgan, Walls & Clements*	35—37
London Guarantee & Accident Building, Chicago	*A. S. Alschuler*	38—40
Boston Insurance Exchange	*Coolidge & Shattuck*	41, 42
American Radiator Co. Building, New York	*Raymond M. Hood*	43
S. W. Straus & Co. Building, Chicago	*Graham, Anderson, Probst & White*	44
Genesee Building, Buffalo	*Edward B. Green & Sons, Inc.; Merrell Clements, Associated*	45, 46
Westinghouse Building, New York	*Starrett & Van Vleck*	47
Keefer Building, Montreal	*Ross & Macdonald*	48

LETTERPRESS	Author	Page
Editor's Forum		50
The Planning of Office Buildings	*Harvey Wiley Corbett*	89
The Office Building Problem in New York	*Ely Jacques Kahn*	94
The Architecture of Office Buildings	*Raymond M. Hood*	97
Chicago *Tribune* Tower Building	*John Mead Howells and Raymond M. Hood, Associated Architects*	100
Some Recent Office Buildings in San Francisco	*William C. Hays*	101
Office Building Vestibules	*William F. Lamb*	105
Johns-Manville Building, New York	*Ludlow & Peabody, Architects*	109
Postum Building, New York	*Cross & Cross and Phelps Barnum Associated Architects*	110
Four-Story Substructure for a Steel Building	*Frank W. Skinner*	111

LETTERPRESS (Concluded)	Author	Page
Office Buildings, Past, Present and Future	*Clarence T. Coley*	113
Pacific Telephone & Telegraph Co. Building, San Francisco	*J. R. Miller & T. L. Pflueger and A. A. Cantin, Associated Architects*	115
Buhl Building, Detroit	*Smith, Hinchman & Grylls, Architects*	116
Eliminating Fire Hazards in Office Buildings	*Rudolph P. Miller*	117
Materials and Maintenance	*Edward Van Vleck*	119
Economic Factors of the Office Building Project	*Leo J. Sheridan*	121
Knapp Buildings, New York	*Cross & Cross, Architects*	133
Pacific Gas & Electric Building, Oakland, California	*Charles William Dickey, Architect*	134
The Architect and The Building Manager	*William Marshall Ellis*	135
Financing the Office Building	*C. Stanley Taylor*	137
U. S. National Bank Building, Denver	*W. E. & A. A. Fisher, Architects*	140
The Office Building and The City	*Earle Shultz*	141
Ashland National Bank Building, Ashland, Kentucky	*Schenck & Williams, Architects*	142
Office Interiors	*John Taylor Boyd, Jr.*	143
Mechanical Equipment of Office Buildings	*Clyde R. Place*	147
Municipal Building, Brooklyn	*McKenzie, Voorhees & Gmelin, Architects*	153
Semmes Building, Washington	*George N. Ray, Architect*	154
Modern Office Building Appliances	*B. H. Belknap*	155
New Caron Building, Montreal	*Macvicar & Heriot, Architects*	158
Bibliography		159

PARKER MORSE HOOPER, Editor

Published Monthly by

ROGERS AND MANSON COMPANY

383 Madison Avenue, New York

Howard Myers, Pres.; C. Stanley Taylor, James A. Rice, Vice-pres.; Robert Sweet, Sec. and Treas.
Yearly Subscription payable in advance, U.S.A., Insular Possessions and Cuba, $6.00. Canada, $6.75. Foreign Countries in the Postal Union, $7.50
Single Copies, 60 cents. All copies Mailed Flat
Trade Supplied by American News Company and its Branches. Entered as Second Class Matter at the Post Office at New York, N. Y.

Copyright, 1924, by Rogers and Manson Company

ALBERT JAMES MAC DONALD

1889 - 1924

It is characteristic of Albert James MacDonald that he never sat for a formal studio photograph. This picture, taken last spring in Venice, will be recognized by his friends as an excellent likeness.

BOSTON PUBLIC LIBRARY

STANDARD OIL BUILDING, NEW YORK

CARRERE & HASTINGS, SHREVE & LAMB, ARCHITECTS

THE EDITOR'S FORUM

UPON THIS PAGE ARE PRESENTED A FEW OF THE MANY TRIBUTES TO THE MEMORY OF ALBERT J. MAC DONALD

I am shocked to learn of the death of Albert J. MacDonald, Editor of THE ARCHITECTURAL FORUM. Rogers, with his rare spirit, gave your journal a broad foundation; MacDonald shared his vision for the future of the profession. We mourn the loss of a sympathetic lover of architecture, a modest but energetic worker, a genial and always true friend.

D. EVERETT WAID,
President, The American Institute of Architects.

I feel sure that the architectural profession as a whole will feel very keenly the loss of Mr. Mac Donald.

THE FORUM for many years has occupied a unique position in the field of architectural publications, and we of the profession are inclined to regard this as an established condition, overlooking the personality which must necessarily stand behind and be responsible for every important work; but we do realize now how much Mr. Mac Donald's untiring efforts and disinterested service meant, not only to the profession but to Architecture as an Art.

HARVEY WILEY CORBETT,
President, The Architectural League of New York.

My acquaintance with Albert J. Mac Donald was limited to those brief interviews when he called to seek material for THE FORUM, or to discuss some feature of that journal. These visits, extending as they did over a number of years, remain as pleasant memories, and they were neither too short nor too infrequent to impress upon me the personal qualities and sincerity of the man.

Mac Donald always wanted the best for THE FORUM. He was critical in the choice of his material, eager in the search for something that would be of real educational value and of practical service to the architect. Alive to all the new work that was being produced, he was always ready to wait, even at the risk of not scoring a "beat," until the kindly hand of time had mellowed both the building and its surroundings. He appreciated beauty. His sympathy for and patience with the architect's point of view made him a welcome visitor.

The architectural profession has lost a true friend, but it will not forget Mac Donald's devoted work to make THE FORUM what it is today.

J. LOVELL LITTLE,
President, The Boston Chapter of the American Institute of Architects.

There are not too many good Editors—men who combine ability with personality—in the whole magazine field, and that we should so suddenly and so tragically lose one of the very best of them cannot but be a source of sincere sorrow to architects, writers and all who have come to look to THE ARCHITECTURAL FORUM for what Albert J. Mac Donald put into it.

His technique of editing went far beyond routine, and the magazine into which he put so much of himself showed from the first the keen discrimination and consistent ideals of the true editor. Always interested, genial and receptive in his personal contacts, Mr. MacDonald won and held the warm personal regard of those of us who wrote for him, as well as of the host of architects who came to know him after he took over the Editorship of THE FORUM.

His loss is a personal thing, not to be measured in words or phrases. The monument to his work is an architectural magazine which commands the interest and recognition of that most exacting of clients, the architect, and the monument to his personality is the real affection with which he will always be remembered by those who knew him.

MATLACK PRICE.

ALBERT JAMES MAC DONALD

1889-1924

The drowning of Albert James MacDonald at Wareham, Massachusetts, on August 17, 1924, brought to an end a life far too brief, but one filled with useful work and crowned with achievement. Blessed with a temperament always buoyant and genial and with a rare capacity for friendship, he overcame obstacles largely by the sheer force of a magnetic personality. A plan once fully made was likely to be followed through with a quiet, steady, driving persistence which disarmed criticism, brushed aside objection, and eventually attained the end held in sight from the beginning.

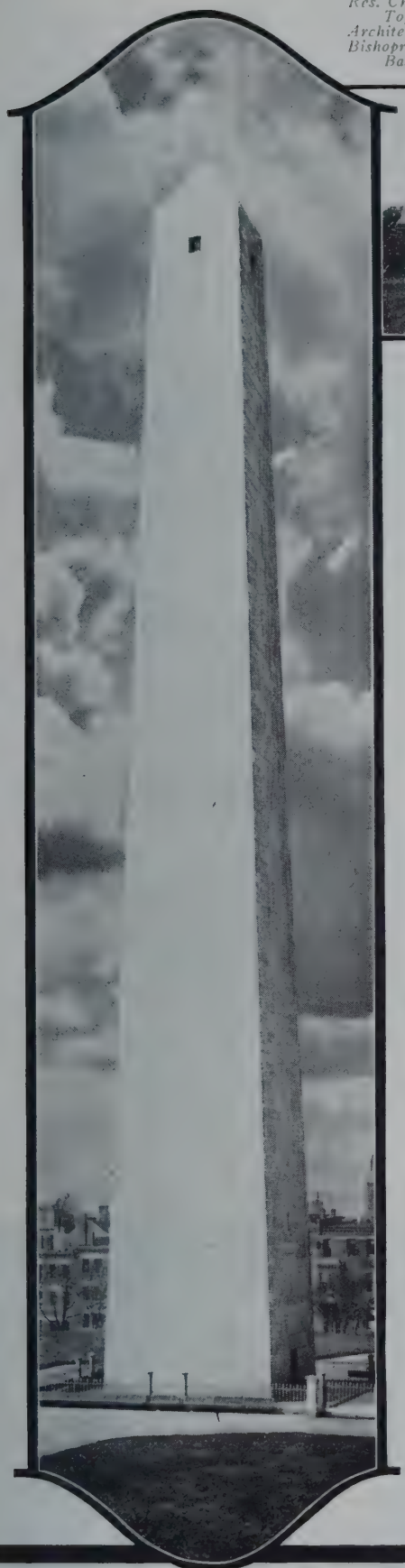
Born in Brookfield, Massachusetts, December 17, 1889, and raised in the neighborhood of Boston, he was educated in the public schools and later studied architecture at the Massachusetts Institute of Technology, beginning his career in the office of Aymar Embury II of New York.

Mr. MacDonald early appreciated the opportunities offered the occupant of an editorial chair,—opportunities not so much for personal advantage as for studying and influencing present-day architectural development. Devoted to the study as well as the practice of contemporary architecture and possessed of business vision and judgment unusually sound, and interested, too, in the opportunities held forth by the publishing field, what was more fitting than that he follow an inclination so plainly manifest? Thus began a course of action which, as viewed now in retrospect, seems to have been, like many of his undertakings, fully and definitely planned from the start.

In 1911 Mr. MacDonald became assistant editor of *The Architectural Review*, then published in Boston. Two years later he became associated with the late Arthur D. Rogers in editing *The Brickbuilder*, which in 1917 became The Architectural Forum, and upon Mr. Rogers' death in 1919 he became Editor of The Forum and President of the Rogers & Manson Company. To his efforts are largely due the steady growth and development which have brought The Architectural Forum to its present position. A rare insight into the problems which beset the modern architect brought an understanding of the functions of an architectural journal, and an editorial instinct naturally keen was developed by constant study and experience.

Along with the buoyancy and geniality of his disposition there went engaging simplicity and frankness. The unassuming manner which characterized all his relations meant much to his co-workers and assistants. Unfailing kindness and large sympathy marked his contacts of every kind, and it may almost be said that by his death every acquaintance has lost a friend.

It is not given to many to leave so complete a record of duty faithfully and successfully performed, or so wide a circle of friends to whom death brings a deep feeling of personal loss.



Res. Chas. W. Kouns, McVicker St., Topeka, Kansas.
Architect: Chandler & Emshwiller
Bishopric Stucco over Bishopric Base on all exteriors.

Apt. Bldg.—George W. Ballou, Owner
West 72nd St., New York City
Architect: F. L. Shea
Bishopric Base and Stucco on all exteriors.

Bishopric Base is to the Stucco What the Foundation is to the Structure

Bishopric Base an Enduring Foundation

Everything that endures must have a permanent foundation. Fifty feet underground is the foundation of Bunker Hill monument. Unseen and unappreciated by the casual passer-by, year after year it supports, intact, the enormous mass of masonry rising above it.

Such is the performance of Bishopric Base in providing a foundation for enduring stucco. Its dovetailed construction locks the stucco in an inverted wedge grip. Proof against moisture, heat and cold, Bishopric Base under stucco weathers the elements for generations unaffected by time and exposure.

Saves Labor and Materials

BISHOPRIC BASE under stucco, saves the homebuilder 30%—it does not take highly skilled labor to put on Bishopric Base, which comes in rolls, is quickly cut to size and can be nailed on by practically anyone. There is no waste, every foot being utilized.

Besides this Bishopric Base saves 25% or more on stucco or plaster materials—First, the dovetail key construction requires less stucco or plaster; Second, the heavy fibre board backing prevents stucco or plaster from going through and dropping down the spacing between the inner and outer walls.

A Permanent Construction

BISHOPRIC BASE locks stucco or plaster in AN INVERTED WEDGE CLASP with a grip that holds for generations—is a non-conductor of heat and cold, insuring a more uniform temperature and greater living comfort—dampness cannot penetrate the ASPHALT MASTIC behind the treated wood strips.

These and many other reasons why Bishopric will serve you best are contained in an attractive, illustrated booklet, "Bishopric For All Time and Clime." Send for it today. No obligation.

Bishopric Is Sold by Dealers Everywhere

The BISHOPRIC MANUFACTURING Co.
103 ESTE AVE. CINCINNATI, OHIO
NEW YORK CITY CINCINNATI OTTAWA, CANADA

The BISHOPRIC MFG. CO. OF CALIFORNIA
LOS ANGELES

BISHOPRIC

"A Complete Wall Unit for all Time and Clime"

Editorial Advisory Committee

J. Clydesdale Cushman

J. CLYDESDALE CUSHMAN
CHAIRMAN

COMMITTEE PERSONNEL

J. CLYDESDALE CUSHMAN
President, Cushman & Wakefield, Inc., New York. (Managing Pershing Square Bldg., Heckscher Bldg. and others.)

CLARENCE T. COLEY
Operating Manager, Equitable Office Building Corp., New York.

WILLIAM MARSHALL ELLIS
President, Hall & Ellis, Chicago.

EARLE SHULTZ
Manager, Edison Building, Chicago. (President, Nat'l Bldg. Mgrs. & Owners Ass'n.)

WILLIAM M. MacLACHAN
Manager, Penobscot Building, Detroit.

COL. GORDON STRONG
Owner and Manager, Republic Building, Chicago. (President, Gordon Strong & Co.)

GEORGE D. McGWINN
Manager, Union Trust Building, Cleveland. (Vice-president, Union Trust Co.)

ISAAC T. COOK
President, Isaac Cook & Company, St. Louis. (Owner and Manager, Arcade Bldg. and others.)

J. F. DOUGLAS
Metropolitan Building Company, Seattle.

FRED SHAEFER
Secretary, Building Owners & Managers Ass'n, Atlanta Trust Building, Atlanta.

Earle Shultz

William M. MacLachan

William Marshall Ellis

Isaac T. Cook

THE Editors of THE ARCHITECTURAL FORUM take this opportunity to express to each member of the Editorial Advisory Committee and to each editorial contributor their sincere appreciation for the valuable coöperation extended during the preparation of this Office Building Reference Number. This background of practical experience has enabled them to present a treatise which will prove to be of enduring value.

Lee Thompson Smith

Clarence T. Coley

EDITORIAL FOREWORD

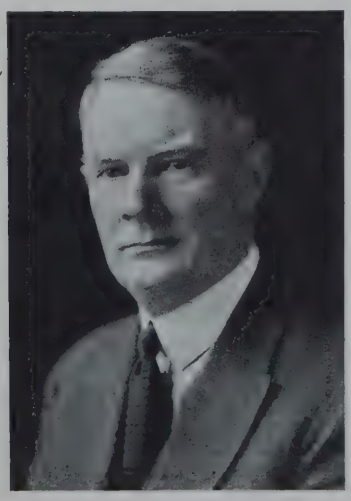
IT is a matter of deep satisfaction to us to be able to present to the architectural profession this Office Building Reference Number of THE ARCHITECTURAL FORUM.

As this is one of the series of Reference Numbers which to a great extent is the work of architects, engineers, building owners and managers who have generously given us their advice and coöperation, we can perhaps take justifiable pride not only in the comprehensive and constructive editorial contents, but in the great variety of useful information contained in the carefully arranged advertising sections. Also we wish to emphasize not only the fact that this Reference Number is a compilation of current information for those interested in the design, construction and equipment of office buildings, but also that through the Bibliography at the end of the editorial section access may be had to many of the articles dealing with different phases of office building design, construction and maintenance which have appeared in various magazines.

The underlying purpose of THE ARCHITECTURAL FORUM in devoting four of its regular monthly issues each year to particular types of buildings, such as hotels, hospitals, banks, etc., is to present to the architectural profession not only a careful analysis of the fundamental requirements every architect has to consider in the actual designing of any special type of building, but also illustrations of the latest examples of such buildings, together with valuable information derived from the recent experience of architects and owners and operators in each particular field of building. These Reference Numbers, which are in fact condensed textbooks on the various and important types of modern buildings in this country, represent a distinctly progressive step toward the constructive and educational status which a truly professional magazine should maintain for the architect.

Col. Gordon Strong

Fred Shaefer



J. F. Douglas

George D. McGwinn

No. 1

Even when laid out with the greatest care and forethought, offices often are outgrown or become inadequate. And when partitioned with plaster or non-portable partition there are weeks of dirt and expense ahead when the layout is changed.

No. 2

But if an office like plan No. 1 is partitioned with Telesco Partition, overnight it can be changed to plan No. 2, or any other layout you want.

This shows the simplicity of Telesco Partition Construction. A few screws hold it solid as rock and enable it to be moved again and again without damage to the partition.

Telesco Partition Gives Movability At Lowest Cost And Least Time Loss

ASIDE from its beauty and perfection of finish, the one thing that has made Telesco Partition the standard equipment in thousands of buildings all over the country is its movability.

With an equipment of Telesco units in reserve, offices can be laid out and partitions erected in a few hours' time.

If a change of layout is desired, the standing partition can be moved without loss or damage, by a carpenter, with no tool but a screwdriver.

Telesco-equipped buildings can give prompt service to tenants and save the expense of alterations of non-movable partition.

Write today for catalogue with full particulars.

Telesco Partition
REG. U.S. PAT OFF.
IT TELESCOPES

IMPROVED OFFICE PARTITION CO. 25 GRAND ST. ELMHURST, NEW YORK, N.Y.

The ARCHITECTURAL FORUM

VOLUME XLI SEPTEMBER 1924 NUMBER 3

The Planning of Office Buildings

By HARVEY WILEY CORBETT
Of Helmle & Corbett, Architects, New York

THE modern office building is a complicated piece of machinery, designed to accomplish a certain definite purpose, to work in a particular way, to house a special group of people which has been created by the separation of home and business. It might be likened to an automobile, whose purpose is a little more evident to the casual observer. As a matter of fact, the office building is a more involved piece of machinery than the automobile. It requires even more imagination, ingenuity, and mechanical, electrical and engineering skill to create a good office building than an automobile which will run well under all circumstances and not discourage its owner with excessive gas and repair bills. The variety and types of office buildings cover quite as wide a range as do motor cars, and it often becomes the duty, sometimes the painful duty, of the architect to advise a prospective client with a Rolls-Royce ambition and a Ford pocket-book to compromise on a Buick grade of office building.

One sometimes thinks of office buildings as a specialty, and of some architects as specialists in this field, but when one stops to consider the factors which bear on the problem, such as irregularities of site, variation in zoning laws, trends of business communities, probable future changes in characters of neighborhoods, orientation, natural light, and financing, all outside or external factors, and then the varying types of office units, proportions of rentable and utility space, unit bay construction, fenestration, corridor widths, toilet facilities, entrance vestibules, elevator distribution, stairways, fire escapes, smoke towers, mechanical equipment, which are all internal factors, it is apparent that an architect who could master all these would be a "specialist" in any other field of building as well.

What then is the first step and how shall it be taken? Like crossing a modern city street, shall one jump into the traffic stream at the first opening and trust to luck and an all-seeing Providence that one reaches the other side in safety, or shall one quietly wait for the policeman's whistle and move with the changed direction of traffic? That, of course, will depend on whether one is catching a train or just out for a stroll. If one is a "promoting" architect one will jump in, take an option on a piece of property, make a sketch plan and a perspective showing crowded streets, and then hunt up a client. If one is a "designing" architect (and most architects have designs on something or somebody), one will at least wait for the client's whistle, and then come running with a design for a particular site which the aforesaid client owns or thinks he would like to own.

In any case, there will be observed the usual proceeding. The first step is to get a site, with or without a client; and the second step is to make a scheme for that site. But let this be said: one question may came up, often does come up to the architect who is working in this office building field, and that is, "Will it pay to build in a certain locality, and how large a lot must be secured to make building economically sound"? Such a question often precedes the securing of a site, and to answer it the architect must have certain general information which will enable him to give a first approximation, something which will show the financial feasibility of a building idea, before any site is selected, any option money paid, or any plans drawn. To do this one must discover some general relation between the square foot of rentable area, or as the British say "carpet area," and the cost of producing or creating that particular square foot of carpet area complete and ready to let.

In first approximations, cost of building is figured in terms of cubic contents. This means, first, that one must have a general idea of how many cubic feet of building are required to provide one square foot of rentable floor space. A calculation made on a large number of well planned office buildings shows that 16 cubic feet are required to make 1 square foot of rentable floor space possible. And this seems right, because if it be expressed in another way, each square foot of "carpet area" will

require for itself some 11½ or 12 cubic feet (height from floor to floor above) of building cube. To this must be added that proportion of extra cubic contents which provides for walls, partitions, hallways, toilets, elevators, basement and cellar spaces, penthouses, roof tanks, etc.

Next one looks at a neighborhood where a building is contemplated, and decides from its general present character and possible future growth, the type and grade of office building that will go best in such a locality. It is possible to determine from buildings recently completed the probable cost per cubic foot of such a structure. A survey of the general character of the neighborhood will give the probable average rent per square foot of carpet area one may reasonably expect to get. This formula will show how it may be readily worked out:

$$\frac{\text{Rent of 1 square foot.}}{\text{Cost of 16 cubic feet.}} \left\{ \text{Gross return on building investment.} \right.$$

Take, for example, a certain type of office building which can be built today in New York for 70 cents per cubic foot. The same building properly located can be rented for $3 per square foot of carpet area.

$$\frac{\$3}{.70 \times 16} = \frac{\$3}{\$11.20} = 26.7\% \text{ gross.}$$

One knows at once whether this will bear further investigation; whether this gross return is enough to cover interest on property cost, building cost, taxes, sinking fund, depreciation, upkeep, maintenance, operating charges, etc. If it were 15 per cent, nobody would touch it; if it were 40 per cent, one couldn't keep capital off with a club! In fact, such a simple calculation as this will give a preliminary idea of how large a lot to try to get, how much to pay per square foot for the property, and how many stories to build.

But to return to the plan problem. Let it be supposed that a site is ready and that a plan is wanted; how shall it be started? The usual procedure in most plan studies is to start with the ground floor and build up. But in planning office buildings, one must reverse this process and start from the top and build *down*. That is to say, one develops a typical upper floor plan first, because there are a large number of typical upper floors to one ground floor. The major income is from these typical floors, and if some sacrifice in plan arrangement is to be made, it might better be made once on the ground floor than to be repeated 20 or 30 times on typical floors. In the same way, and for the same reason, the typical floor must be planned on the basis of the typical office unit. So one first plans this unit, then one strings several of these along both sides of a corridor, then places the necessary line of vertical circulation (elevators) at a central point off this corridor, making sure that no unfortunate tenant has to walk over 100 feet from his office door to an elevator; then are added some utility spaces in the form of toilets, cleaners' closets, vent shafts, flues, etc., and the plan is made. Of course it must still be warped, bent and twisted until it fits the lot, has assured natural light in all offices, will work to a possible steel frame, and made to conform in a few other ways which will be mentioned later in discussing this subject.

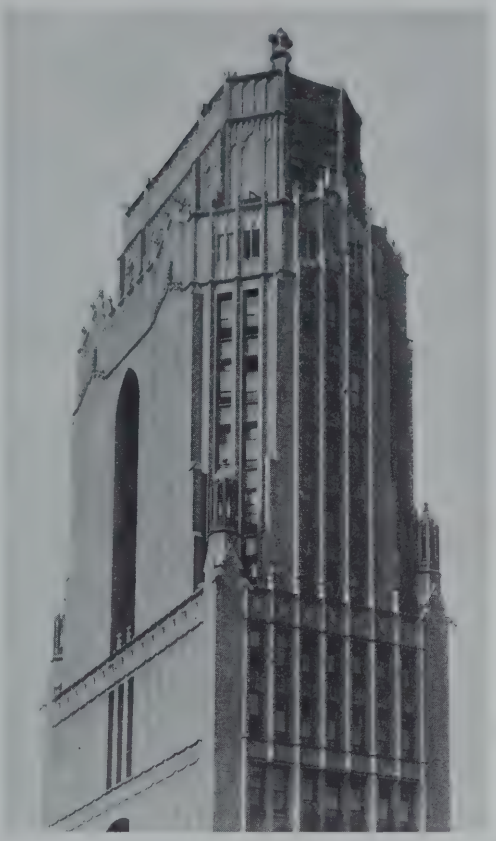
The Bush Terminal Building, New York
Helmle & Corbett, Architects

View Taken from Bryant Park Shortly After Completion

What is the ideal office unit? Fortunately, authorities differ; otherwise the poor architect would only occasionally be able to plan the "one perfect office building," whereas now every one planned, is the *one* perfect office building. But authorities do agree on one thing, which is that it is better business to construct less building, and have shallow offices, well lighted, than to have more building with deep offices poorly lighted. In other words, it is better to have less space (less capital investment) permanently rented at a high figure than too much space partially rented at a low figure.

The depth of a well lighted office (by depth is meant distance from windows to corridor) is never over twice the clear ceiling height, and 20 feet is better than 25. C. T. Coley, Equitable Building Manager, says 24 by 16. The width of the office unit will vary with the distance between steel columns. Economical engineering consideration puts a limit on this of not less than 15 feet or more than 22. The structural steel engineer wants as many columns as he can get,—he wants them all evenly spaced and no offsets. The designer wants the columns where the archi-

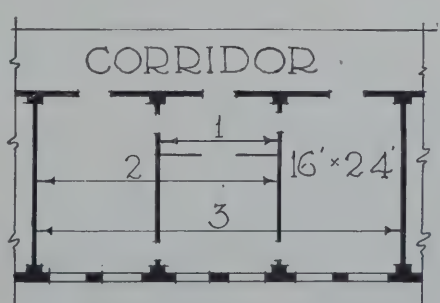
tectural effect both of exterior and interior will have the best appearance and proportion,—and the owner doesn't want any columns anywhere. The architect, as usual, must maintain the proper balance among all these and really space his columns where, by the use of standard shapes and regular distances, he will get the freest unbroken floor spaces in the offices and yet secure economical steel construction. A great deal of good money is buried out of sight behind concrete and plaster in unnecessarily complicated steelwork, designed to meet some fanciful idea of the architect which seldom if ever justifies in its architectural impressiveness the practical sacrifices in space and money.



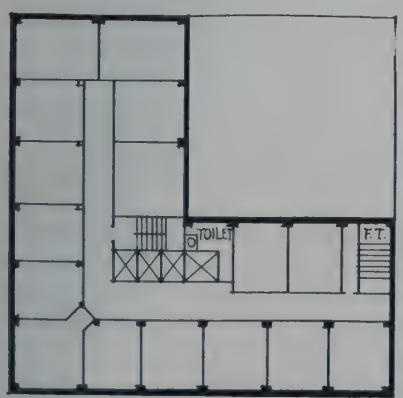
Detail of Bush Terminal, New York
Helmle & Corbett, Architects

Corridors which are important, as a means of access to the offices, can give or destroy the *tone* of a building. One might suppose there was a practical width for a corridor running between offices and that it need never be wider than this. Probably a 4-foot corridor *would* serve all practical purposes, yet one would wish to be the last to suggest such a standard because corridor *appearance* is quite as important as corridor *width,* and the appearance is, first of all, a matter of proportion. A short corridor may be narrow, but a long corridor must be wide, and all corridors should increase in width as they near the elevators. A little extra space in corridors is money well spent and counts more than elaborate and expensive use of marble wainscoting and mosaic floors in corridors which are not designed wide enough.

The diagram plans show a typical office unit with possible internal divisions, or the possible combining of several units in a single large office. The plot plan diagrams show possible dispositions on some standard lots as they occur in New York. It will be noted that "dark" spots in plans, such as always occur where wings join a main building, are used as far as possible for the necessary utilities, and this brings up the question of location of toilets, elevator facilities, stairways and smoke towers. All of these except the smoke towers may be inside in "dark" spots. Toilets can be artificially ventilated and lighted, but it seems better to place them on small back courts which would only give questionable office space at best, and to retain for the toilets some degree of natural light and full natural ventilation. The British building laws require outside toilets always; that is, they must always have outside windows, no matter how much artificial ventilation may be provided. They also provide separate toilets and wash rooms for executives, rather than attempting individual office lavatories. This seems to be a good idea if the grade of building warrants it. The British generally group all the toilets on the roof, as some of the older and lower class buildings do here, but modern practice in America is to provide ample facilities of this nature on every floor, and it is nearly always possible to find a

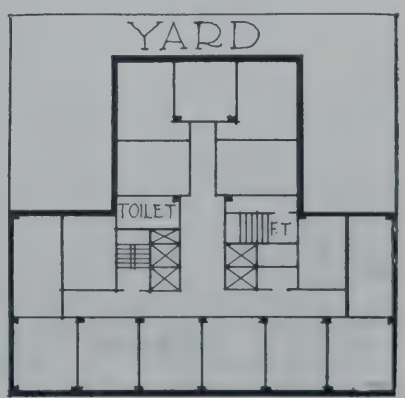


Three-Room Office



Corner Lot, 100x100

Corner Lot, 50x100



Interior Lot, 100x100

space in every plan where they can be placed without sacrifice of rentable area. Wash basins, of course, should be in every office. Plumbing lines can be run on inside columns near the corridor sides.

Stairways in American office buildings are merely fire escapes, they are so seldom used. Occasionally tenants will use them from floor to floor, and because the laws require them to be entirely enclosed with fire-resisting walls and doors, they can never be a conspicuous or even a visible feature; in fact, a man who couldn't read English couldn't find them. British practice, which limits the heights of buildings to nine or at the most ten stories, provides one conspicuous open stairway and then has one or more enclosed sets of stairs as in American cities. The tenants will actually use this open stairway, even when ample elevator service is provided. Such is the influence of habit.

The location of stairs in America is only a matter of utilizing dark spaces in the plan not suitable for any other purpose, and putting the stairs in them. If two stairways beside a smoke tower are required, then they must be well separated. But one would not think of stairs in an office building as an essential part of the vertical circulation. They are necessary, but they do not figure in the plan scheme as the elevators do. Elevators are the real means of vertical circulation, and their location in the plan is as vital as the location of the spinal cord in the backbone.

Elevators are an essentially American development; their use here is almost universal and would be sometimes regarded as necessary even in a two-story building. They are often the key to the plan scheme, and they also limit the area over which a building unit may be developed. By this is meant that elevators should be grouped together because the efficiency of the service is greatly enhanced. Even a small building must have at least two (to meet the emergency of a breakdown), and if more are needed, because of greater floor area or greater number of stories, they should be so placed that a tenant waiting for a car may be able to step easily to the first one that flashes a signal. A battery of six elevators, three facing three, is the ideal arrangement. Eight, four facing four, are possible. More than this are the equivalent of separate lines, because the passenger can at best reach only one of eight; the rest would pass before he could get to them.

As the problem increases in area, the number of elevators increases, and since, as was said before, the maximum distance any tenant should be expected to walk from elevator to office door is 100 feet, the amount of ground a building may cover (if fed by one system of vertical circulation) is pretty definitely limited. If more than one system is installed, it must be separated far enough to effectively serve a new area, and the plan problem simply repeats, *i.e.*, two buildings side by side, but with connecting corridors.

As buildings increase in height, but do not exceed a ground area which one group of elevators can serve, they may still require more than a battery of six or even eight. Thus the problem becomes two buildings, one placed on top of the other, with the vertical circulation of the top building running through the lower as an "express" service. As 100 feet each way from the elevator line is the limit one may go horizontally, it might be said that 15 stories is the limit of a single battery vertically. Zoning restrictions in New York limit very high buildings to towers which cannot exceed 25 per cent of the total lot area, so probably this theory will not be applicable to structures of over 30 stories in the future. A word about freight elevators in office buildings. They are necessary but not so important as in loft buildings, and should be located near the passenger cars, and finished well enough so that during rush hours, morning, noon, and evening, they can sometimes be pressed into service for accommodation of passengers.

The plan problem has been discussed from the angle of the various elements which compose it; let it now be examined in its broader aspects. The over-all width of a building wing, composed of two rows of offices flanking a central corridor, should be between 50 and 60 feet, and when such a wing is not too long and abuts the main building where the elevators

Bush Terminal, London, from Aldwych
Helmle & Corbett, Architects

Strand Facade of Bush Terminal, London
Helmle & Corbett, Architects

are, no utility should be placed at the far end which necessitates maintaining a full-length corridor. Such wings should be planned so they can be let in large units, getting rent for what is usually corridor space.

The question of the division of floor space into offices leads to the consideration of window spacing and height. The usual bay between steel columns is from 15 to 20 feet, in which bay experience and serviceability seem to dictate the use of two windows rather than three. One window to a bay gives too much wall space and too little light, while three windows give too little wall space and too much light. An even field of equally spaced windows is more elastic for interior division into offices. The *amount* of natural light is not as important as the quality of light. No one could do business in a hothouse. The average client has the mistaken idea that the larger and more numerous the windows are, the more desirable the building is, forgetting the annual cost of heating the window glass, of which the tenant closes off from 50 to 75 per cent with shades. High light is always better than low. Windows located with regard to exterior architectural effect, rather than to interior comfort and convenience, sometimes extend nearly to the floor, above which is left a dark void of wall space and ceiling. Many windows of average size are preferable to a few large openings, on the same principle that several well distributed ceiling lights in a room give better light than one powerful center light. Too much glass surface causes economic waste and physical discomfort. From both standpoints it is undesirable.

No general principle can be laid down for the planning of ground floors. Conditions vary so widely according to the local problem that the architect must use his planning ingenuity to make the most of the fixed conditions which come down to him from the floors above. Steel points are fixed (one or more may be carried on girders because of some special need of free space); elevators and their doors are fixed; stairs and smoketower stairs must reach a lobby and the street; all else is space through which an entrance hall to the elevators must be provided. The more direct this is the better. At the entrance, again, the tone of a building can be established. An ample entrance, well proportioned but not too large, leading directly to the elevators, will do more to make the building seem important (and make the tenants feel important) than any other interior arrangement.

In regard to the planning of basement floors, much depends upon the height and size of the building. A building of approximately 15 stories on a side street is likely to have only a basement and sub-basement, in which case the boilers, motors and other mechanical equipment are usually located on the basement floor. But in buildings centrally located and of many stories in height, as many as five floors are often built below the sidewalk level. In any case where the location or size of a building warrants it, the plan of the basement or first floor below the sidewalk level could provide for a barber shop, restaurant, bootblack stand, billiard room or bowling alley. In fact the space might be rented for any purpose or use not requiring natural light. In such cases the boilers and mechanical equipment are located on the sub-basement floors.

Now a last word about the exterior of the building. The title of this article is "The Planning of Office Buildings," and someone else is to discuss facades; but one cannot imagine planning anything without *thinking* of the possibilities of the facade. A good plan should give a good elevation; but it never does, except in the hands of a good architect, who, one may be sure, has been thinking about elevations (not just one elevation, but possibilities in elevations) during all the planning operation. American office buildings are unique in world architecture, because of their mass, proportion and silhouette and not because of their detail. Fine as this detail often is, it alone would never make a poorly proportioned mass distinctive. Mass and proportion and silhouette are matters of *plan*. Good detail is like the cultured manners of a gentleman,—a very splendid addition to a handsome man. Some men are handsome without manners, and are then interesting only at a distance. Many of our office buildings are the same,—interesting at a distance, which is perhaps better than not being interesting at all. The perfect building is the combination of mass, proportion, silhouette and detail.

The Office Building Problem in New York

By ELY JACQUES KAHN
Of Buchman & Kahn, Architects, New York

THE design of the modern high office building is unfortunately only in a very limited sense a purely æsthetic consideration. Before the construction of a building can actually be started, various necessary and important economic and technical problems have to be worked out so that the owners will be satisfied that property costs are fair, that the stability of the locality will maintain the basic land value and, further, that the complete analysis of building and land costs, with the carrying charges, architect's fees and other incidental costs, makes the financial aspect of the undertaking interesting to the investment companies and real estate operators. So it is safe to assume, if a building or permanent loan is to be obtained, that the practical requirements have been thoroughly studied and determined upon before lending companies agree to underwrite the operation's financing.

The site will determine the character of the structure. If it is to be an office or a loft building, quite different requirements will have to be met. If the neighborhood is likely to change within a reasonable period so that one type rather than the other will rent better, the building must be so flexibly planned and constructed as to facilitate such transformation. The height can be determined by computation of rents as against cost. A taller building requires more elevators, possibly express service, and as the height increases and setbacks required by the zoning law develop, the margin of safety between available areas and possible rents quickly marks a safety point which it is dangerous to ignore. It is obvious that for particular reasons, such as advertising value for instance, excess height is sometimes possible without consideration of cost or return on investment. In connection with the matter of height, it is interesting to note that a good deal of consideration has been given to the development of such sections of New York as that between Seventh and Eighth Avenues from 34th to 42nd Streets, where a number of fairly tall loft buildings are in close proximity to each other. The streets are narrow in proportion to their use, producing a freight congestion which grows more serious as the number of tall buildings increases. This feature of the problem is not covered by the zoning law, which interests itself mainly in the matter of light, open areas, safety exits, materials, construction and the like. The individual owner is little interested in what happens in a few years, so long as his building possesses the maximum of serviceability as well as accessibility.

No. 24 West 40th Street, New York
Buchman & Kahn, Architects

The loft building intended either for manufacturing or showroom purpose will have less expensive equipment in certain respects, especially as to finish of public spaces, though other requirements such as sprinkler system, possibly package and refuse chutes, add to the general costs. In the planning of the loft building, after column centers have been determined, particularly as to steel economy, the owner may discover that the number of columns is considerable. Then the delicate point arises as to how far one can go in reducing this number without too greatly increasing spans and cost in order to improve the rental desirability derived from unobstructed floor areas. Where the setback floors occur, it is necessary for the designer to take care where the columns are placed, so that all possible available floor space may be left for locating machines or showrooms or whatever else the

building is planned for. The position of stairs, toilets, fire towers, etc., will have a bearing on the question of the subdivision of floors, though the positions of these main services together with the elevators and public corridors, if any, will be determined by the area of the plan. For an area approximating 20,000 square feet per floor, a central group of passenger elevators, backed by freight elevators, permits a reasonable distribution of floor space, while for smaller areas, particularly on inside lots, the service facilities will obviously find their places on the side.

Ceiling height can be determined after the block requirements of the zoning maximum are established by the particular facts concerning the use of the building. These heights from floor to floor will vary from 12 feet, 6 inches to 10 feet, 3 inches, which is a minimum for a building of average floor area. If the area is small, lower ceiling heights are more desirable on the theory that the perspective of large spaces with relatively low ceilings is disturbing. Due consideration is given to the location of sprinkler pipes and to the fact that merchandise must be kept at required distances from the sprinkler head levels. The court area prescribed by law is often not sufficient to properly ventilate the floor area, so an additional sacrifice of floor space may be of considerable value in improving what might otherwise prove to be dead space.

The distinction between the loft and office building has been emphasized because the rapid change of the character of districts in New York necessitates precaution and foresight if the investment value of the property is to be fully protected. The 25 per cent manufacturing clause in the building code makes it possible for almost any modern structure to be used to its fullest capacity, due to the fact that after computation of stock room, show room and incidental use of floor area, few loft buildings need more than 25 per cent for actual manufacturing purposes. The plan requirements to make this use possible are matters of secondary importance, as they refer particularly to stair exits, sprinkler sys-

Bouzan Building, New York
Buchman & Kahn, Architects

Garment Building, New York
Buchman & Kahn, Architects

The Arsenal Building, New York
Buchman & Kahn, Architects

tems, positions of fire towers and freight elevators.

The window problem presents special difficulties. The steel window, which does not need a large box to be built in the wall as the steel frame rises, has a definite advantage over the earlier prototype in wood. Without entering into the subject of the details of the windows themselves, it is pertinent to consider the spacing of the windows and the relation of the openings to the wall, not only as a matter of design, but primarily in relation to the arrangement of partitions that will permit a flexible subdivision into offices. There can be little discussion as to the value of maximum glass areas, though, to be sure, in proportion to the amount of glass area, the heating requirements are relatively greater or less. The happy medium can be reached only by a careful consideration of these facts and an agreeable arrangement of the fenestration as a matter of design. In the lower stories, show window requirements force upon the designer a definite struggle between the classic tradition of supporting piers and the present-day demand for a maximum amount of glass-encased display space. It is trite to assume that the modern designer thinks any longer that it is necessary to make his tall building look as though it were carried on masonry. As long as commerce persists, articles will be displayed and large windows will be required. Whether second or even third story show windows are advisable depends largely on the particular neighborhood and the character of the building. The material clothing the steel of the lower stories is of importance from a practical standpoint because experience has proved that it is wise to provide a hard substance such as polished granite to protect the piers to a height of at least 5 feet from the passing public. The narrow piers are frequently covered with a material of dark color, such as granite, marble or iron, so as to frankly make a dark base for the entire structure, assuming that the show windows themselves are dark in appearance as against masonry of light brick or terra cotta above.

It is interesting to record a growing desire among owners of commercial buildings to encourage the special study of equipment details in order to break away from the ready-made stock designs, using instead specially designed equipment possessing originality and beauty of detail. In the case of such essentially necessary objects as elevator doors, mail boxes, bulletin boards, elevator cars and the like, it is remarkable to what an extent today the designer is permitted to go in order to produce an interesting and ornamental solution. The carping critic may suggest that such expenditure is only good as advertising, but it seems to be proved that once the major details of the structure are fairly well developed, the architect is allowed a great deal of liberty in the minor details, if he himself has the imaginative ability to visualize the beauty and charm to be derived from specially designed details.

The matter of the facade is in itself a question of clothing. Given the steel skeleton and assuming that the architect has followed the designing of the skeleton quite as carefully as any other part of the structure, it falls within his province to allow his fancy to roam within the bounds prescribed by the particular piece of work. Sometimes the site may be located near buildings so conspicuously bad or good, as the case may be, that recognition of them must be taken in the character of his design. Unfortunately, the question of style, which is still one of our specters, has precipitated the spirited struggle now ensuing between the purists, who may have more books than imagination, and the other brave souls who are fighting for a logical architectural expression.

It is a fact that in these large buildings lie amazing possibilities of design. The difficulties are obvious,—the large number of windows, the rigid limitation of materials both from the standpoint of legal restriction and practical consideration of cost, the continuity of similar masses, all are characteristic of the present-day steel frame construction. But hope lies in frankness and honesty of expression.

Exterior Architecture of Office Buildings

By RAYMOND M. HOOD, *Architect, New York*

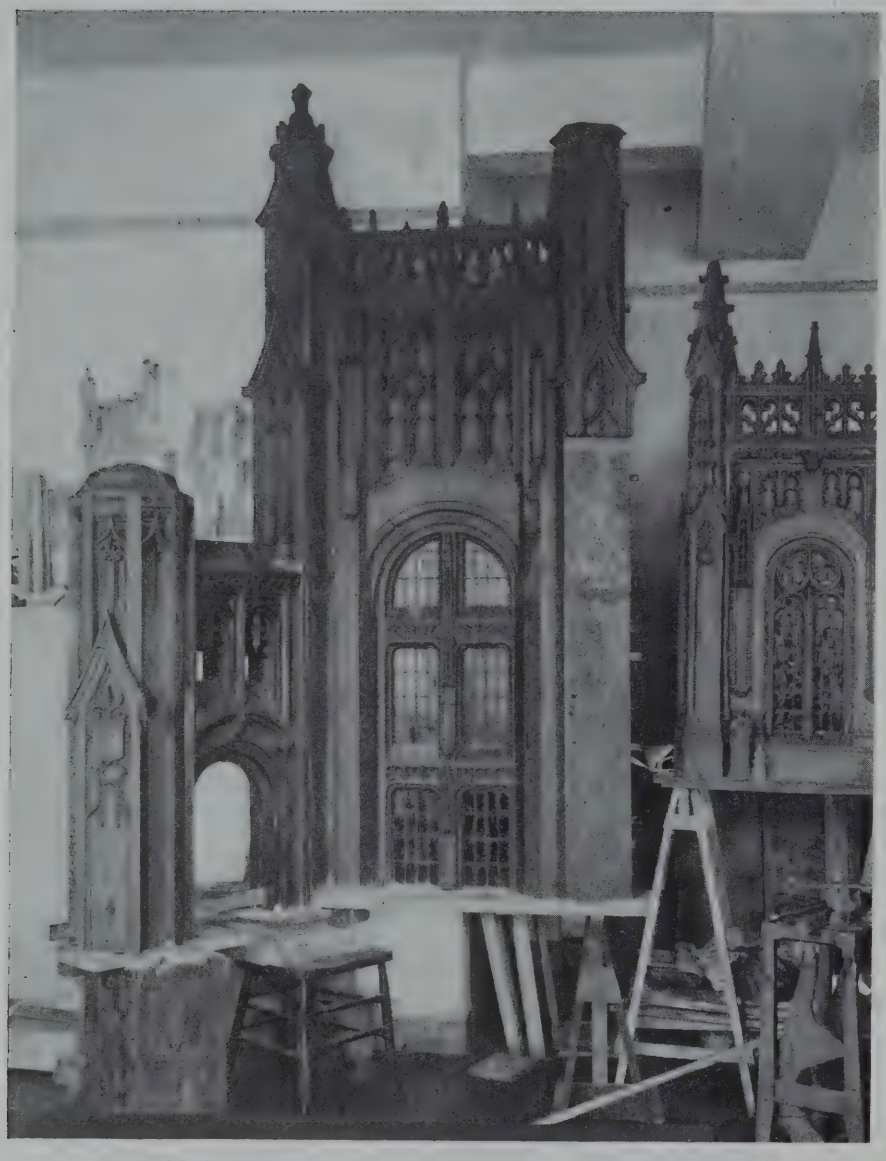
WHEN asked to write an article on the exterior architecture of office buildings, I was at loss as to what to say, for the other articles in this same issue about window spacing, office arrangement, height of floors, and so forth, seem to cover all of the essential elements of exterior design. There remains only one thing further to say, and that is, take the exterior of your building, divide it into the proper number of stories, make an arrangement of windows that is dictated by the renting and lighting conditions, and then proceed to make the resulting mass attractive, by one means or another. This is the only way to go about it.

My experience, which in reality consists of designing only two skyscrapers, does not justify my expressing an opinion as to whether a building should be treated vertically, horizontally or in cubist fashion. On the contrary, it has convinced me that on these matters I should not have a definite opinion. To use these two buildings as examples, they are both in the "vertical" style or what is called "Gothic," simply because I happened to make them so. If at the time of designing them I had been under the spell of Italian campaniles or Chinese pagodas, I suppose the resulting compositions would have been "horizontal." I can see no reason in the world why there should not be as many horizontal or vertical lines in a building as a man wants, providing the horizontal lines do not waste floor height unnecessarily or the vertical lines sacrifice the window spacing unreasonably. The skyscraper problem is new; we have practically no traditions and, after all, serious architectural study is a new thing in this country; so it is fortunate that up to the present no one has formulated too strict a set of rules for our guidance. Another hundred years may, of course, change this; but if there is any one thing that gives reason to hope that a strong architecture will develop in this country, it is that we are all as free as the wind in trying out every idea that comes into our heads. Nothing but harm can result if at this stage in our development the free exercise of study and imagination should stop, and the standardizing and formulating of our meager knowledge and experience should now take its place.

It might be proper to say something precise about the different styles, but I am as much in the air about style as I am about everything else. At a dinner of architects at the University Club, Mr. Saarinen, after listening to one of our perennial discussions about style, the use of precedent, and plagiarism, in a delightful speech said that he could not understand why we discussed it so much, nor why a divergence in ideas should worry us. He spoke of the birds of the forest where each sings his own songs with a result which is not a discord but a harmony of beautiful melody.

After all, are any of our skyscrapers as slavish copies of any style as our critics like to think? Are the few ornamental details that may happen to be Henri II or Lucius the Great an essential part of the skyscraper problem? An office building is no more a slavish copy of the Chateau of Blois merely

Models Showing Development of American Radiator Co. Building
Raymond M. Hood, Architect



Models in Clay of Chicago *Tribune* Tower Details
John M. Howells and Raymond M. Hood, Associated Architects

because a little Francis I ornament is applied to it than an elephant with a yard of lace thrown over his back is a copy of a French manikin in a Paquin dress! Regardless of the amount of superficial ornament that may be copied, a first century Roman would at least be puzzled if he were placed in front of the Pennsylvania Hotel and told that it was a "Roman" building. Style and surface ornament are only the hooks on which critics hang their wares, and in reality, are they not a very minor and unessential part of the problem? I will admit that I have one aversion, which is rattling the bones of a five-story Italian palace and stretching them out to do duty for a 35-story office building. That aversion, however, is personal, and has no more value than the pet aversion of anybody else.

The Editor has suggested that I am supposed to have some particular theories about color. My convictions and theories on this phase of the subject are about as strong as my convictions on the other elements of the exterior design of office buildings. In fact, viewed from any angle, I feel that while there is a great deal for the architects who are building skyscrapers to do, there is very little for them to say. Nobody has as yet produced a building so beautiful that we can all peacefully settle down, write the rules of the game, and copy it through all eternity.

The laws controlling the exterior architecture of skyscrapers can go no further, I believe, than this: that the exterior should be big enough to cover the inside of the building, and thick enough to keep out the weather; or, to borrow a remark of another architect, the facade must be useful. The remark about the size of the exterior is not completely idiotic. Anyone who looks out over New York or any other American city, at the forest of roof tanks, elevater penthouses and bulkheads that jut up against the sky, or who keeps a weather eye out for fire escapes and other excrescences, must come to the conclusion that the practice of putting an undersized exterior on a building has become altogether too common. Every now and then, if you slip around and take a look at a building with a pretentious front, from another street, you may find the rear exposed in a rather indecent fashion. I will not discuss my contention about the weatherproof qualities of the exterior.

Fortunately, however, pretentious, false tops have gone out of vogue for office buildings, as well as the fashion of putting an ornamental front on one or two sides of a building, according as it is located in a block or in a corner. The zoning law in New York has done a great deal to revolutionize and improve the design of the exteriors of tall buildings. As the setback of the upper stories exposes more wall surface to the up-gazing public, architects have been compelled to devote more time and study to the treatment of these pavilions or towers as the case may be. The tendency of today is to treat the entire building as though it were a detached, free-standing structure, introducing a new spirit of truth and consistency in external structural expression, which is now evidenced in every successful building.

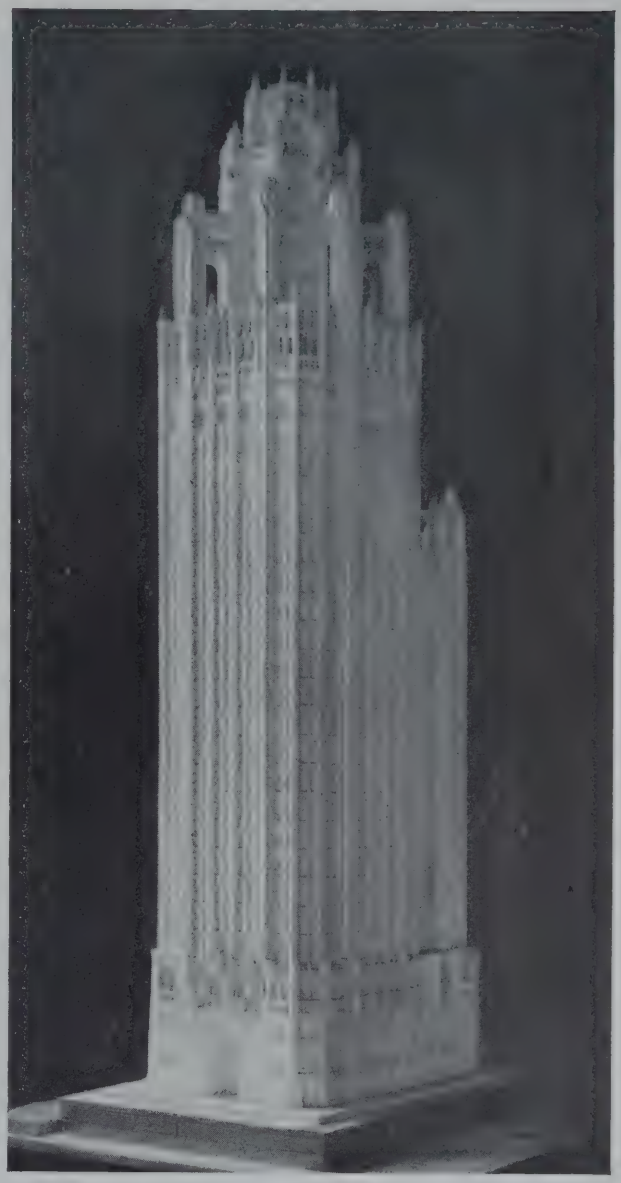
EDITOR'S NOTE

IN the brevity of his remarks on the Architecture of Office Buildings, Mr. Hood has apparently been influenced by his belief "that while there is a great deal for the architects who are building skyscrapers to do, there is very little for them to say." It is due to this modesty that the Editor feels justified in adding a brief note on the manner in which Mr. Hood studies the problem of office building architecture. He studies his problem in the round rather than in the flat; in three dimensions rather than in two. In other words, given the number of stories and the floor area required to produce an adequate return on the investment and the amount of open space required by law, small scale plaster models of the building are made. From the first model, which shows only the mass of the building and its relation to surrounding structures, the owners can obtain an adequate idea of the amount of light and air obtainable on all four sides of the building. This is particularly important in the case of structures located in a block rather than on a corner, such as the new American Radiator Co. Building, where an unusually successful plan has been evolved by treating the building as a free-standing square tower with all of the elevators, stairways, halls and toilets grouped at the center of one side of the building, leaving the other three sides open to the light and air. By this plan the entire rentable floor area is adequately lighted, and the semi-dark center, found in many office buildings, is completely eliminated.

From the small scale model, showing the mass of the building with blank wall surfaces, setbacks and projections, a larger scale model is evolved which carries the design into the field of exterior architectural expression. The general lines of the building are worked out in greater detail, and the windows and the floor levels are indicated, as well as the general decorative treatment. Finally a third model at a still larger scale is made, on which is shown quite accurately the architectural ornamentation. No line drawings or even colored perspectives can give the owners quite as definite a mental and visual impression of what the completed building will look like as does a carefully and accurately made scale model.

Mr. Hood carries this elimination of drawn elevations and details still further. Skilled modelers are employed who take from the scale model the suggested architectural detail and develop it at a large scale in modeling clay, from which the play of light and shade, relative projections and contours may be carefully studied. When these studied models are satisfactory to the architect, three-quarter and full-sized details are prepared from them by the draftsmen. In this way vigor and vitality are given to the detail, rarely attained by the old method of tracing paper study. It is said that Michaelangelo, in all his architectural work, first modeled the details from which his builders and stonecutters directly executed the work.

Illustrations of the models of Mr. Hood's two skyscrapers show that he has a deep appreciation of the importance of strongly marked vertical lines, emphasizing and indicating the steel frame which the exterior architecture protects and encloses. The termination of these vertical lines or piers in ornamental buttresses and finials is appropriately and successfully handled. In each design the lower stories form a projecting screen, back of which rises the towering bulk of the building. This treatment permits the introduction of large show windows on the sidewalk level, without detracting from the apparent structural strength of the base of the building. The use of two windows to a bay, rather than one or three, has been proved to be more practical for later interior arrangement as well as to be more effective in the exterior dividing of the facade. Attention should also be called to the pleasing treatment of the corners of the *Tribune* Tower and the American Radiator Co. Buildings, where quarter-hexagons fill up the angles formed by the center bays of each facade.



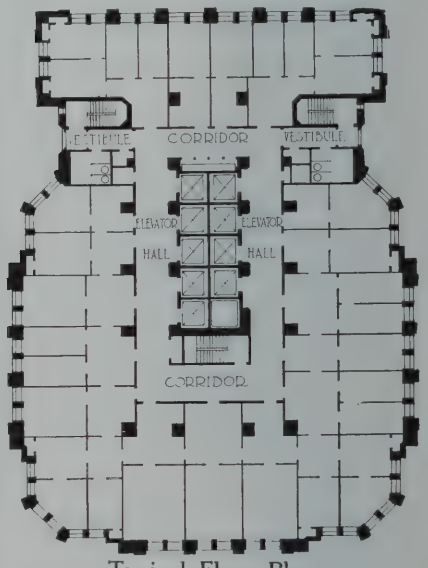
Model of The Chicago *Tribune* Tower, Chicago
John M. Howells and Raymond M. Hood, Associated Architects

Although Mr. Hood may modestly refrain from expressing any definite opinion on the architecture of office structures, his work speaks for itself, showing as it does a grasp and understanding of the practical as well as architectural requirements of office building design and exterior structural expression.

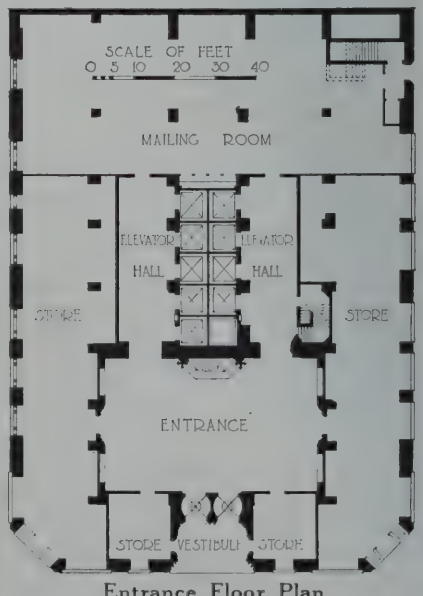
The *Tribune* Tower Building, Chicago

JOHN M. HOWELLS, RAYMOND M. HOOD, Associated Architects

AWARDED, after one of the most extensive competitions ever held, to John Mead Howells and Raymond M. Hood, Associated Architects of New York, the Tribune Tower Building is now in course of construction. Granite and limestone are being used to cover the steel frame construction. The floors are formed by concrete slabs. Steam water tube boilers will supply the heat. Electricity for power and lighting will be supplied by a service company. The electric elevators will be finished in steel, enamel painted. The windows will be metal frame and sash.



Typical Floor Plan



Entrance Floor Plan

Some Recent Office Buildings in San Francisco

By WILLIAM C. HAYS, *Architect, San Francisco*

AMONG those critics called "fearless" may not some be merely brazen? Are there others merely cruel? Have some the courage of half-knowledge, and others only that of mean souls? On the whole, it is an unwise critic who does not at least try to envisage for himself some mental picture of the contemporary drift before daring to enter upon an estimate of specific things. A little light, first, on what the world is thinking and doing!

Where, with the least difficulty in research, can the most authentic and the most recently collected data be found on the subject of this paper? Before me, the ink scarcely dried on the many plate pages, is the Book of the Chicago *Tribune* Tower Competition. A most alluring prize was the award which would—and did—spur the spirit of emulation among many of the virile designers of our time. "To erect the most beautiful and distinctive office building in the world" (to quote the program) is an inspiring opportunity for any and all of us. Here in this book, then, is our far-reaching symposium.

Just what bearing the designs submitted in the *Tribune* competition have upon the problem of the office building in general, it is hard to say. By the very wording of the title there is indicated a certain *parti*, because of the definite designation as a "Tower." Perhaps herein is the explanation of the type of architecture which is so prevalent in the competition, because, setting aside differences of stylistic treatment, and reaching down into more fundamental matters than the possible division into Classic, Gothic, "Modern" and like categories, there is evident among these projects a conviction for the dominance of vertical lines. Yet this is hardly to be taken as indicating that the controversy of the last 30 years or so is over, and that the expression of the steel frame, as such, is finally accepted as the American ideal in the architecture of the tall office building popular today.

To be sure, a few of the designs are insistently heavy masonry in indication, with their look of self-bearing walls pierced by countless small office windows. Here is evidence that there are still strong contenders who hold conservatively to this type, and some of these drawings are masterly works showing, by the composition of their various parts, ingenious devices to rise above insurmountable difficulties, relied upon in vain. These, based upon Classic or Renaissance models, show the weakness inherent in the relation of crowning tower to lower structure, when they are compared with the drawings in which the vertical lines are dominant. One of them, for example, resolves itself into a glorified Roman temple, reminiscent of the *Maison Carre* at Nimes, with a pinched stylobate, the whole lifted hundreds of feet in the air over a pedestal which is, in itself, beautifully complete. Still another has a crowning element which consists of the New York Stock Exchange and, since that seemed insufficient to its author, upon its back is carried the Masonic Temple of Washington, both at diminutive scale. Dividing such compositions at their main cornices, there remain two satisfying structures, neither, however, having integral relation to the other.

Another type of composition, occurring frequently, showed the influence of the New York "Setback Law." From our European confreres came schemes of many-storied steep gables,—these of a type which, though alien, give much food for thought; and one of the American designs showing this *parti* is among the best in the book.

Entrance to the Standard Oil Building
George W. Kelham, Architect

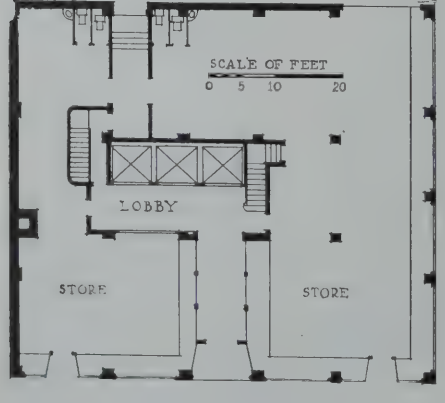
Responding to the suggestion in the title of the program, however, are the great majority of studies, more or less successful, including the winner of that most enticing "Fifty Thousand Dollar Prize," and going down through the class of the "also rans." It is this concurrence which might reasonably be taken as indicating in a general way the trend which is winning out in the tall American office building today. Those qualities which distinguish such designs as a group are: first, the essential unity which has come from harmony between the

Alexander Building, San Francisco

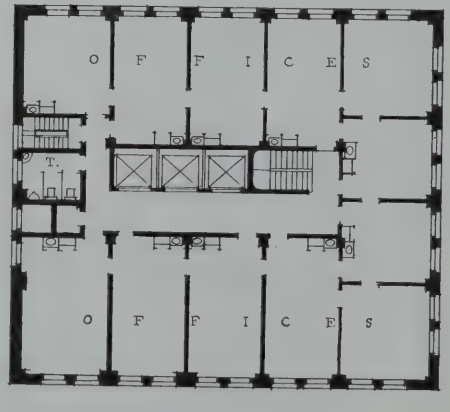
soaring lines of encased steel columns and the vertical massing of the building as a whole; second, the omission of large cornices and the suppression of other projecting horizontal elements; third, the potentialities in nice choice of line for subdivisions in height, whether by slight belt courses or by specially developed architectural forms; fourth, common to all,—whether good or bad in detail,—the mobility of skyline, not solely attributable to the tower nature of the problem.

We must not be carried away and attach too much importance to this fourth deduction, else we find ourselves in controversy with the organized Business Building Managers who will point out that the top floors of the Woolworth Building are a losing gamble, and that from the commercial point of view only flat roofs, with upper stories of relatively large renting areas, will be tolerated. This argument is unanswerable, for the office building is built to house offices and to earn money. Let us pause here a moment. The *Tribune* Tower is different. It is not, *per se,* intended to be a money-maker. Like the Woolworth Building, it is a money-spender, for it is the main advertising project of a great daily newspaper, which has taken this novel way to use at least part of its publicity budget.

And now, to come to San Francisco! If, in the light of this analysis of what may be taken as the authoritative symposium on the subject of office buildings, we have nothing conspicuously novel among the newer high buildings in San Francisco and its vicinity, there are, nevertheless, several works which are to be regarded as distinct accomplishments if compared with actual structures elsewhere; even though most of our buildings have been of such nature that the architects have been motivated at least in part by "earning capacity"—justifiably so in every instance.



Plan of Ground Floor



Plan of Typical Office Floor

Lewis P. Hobart, Architect

In any description of the recent works there is no question as to the according of first place, all considerations of architectural merit aside. From its size, and from the fact that its architect was unhampered by commercial limitations,—if, in fact, not encouraged to spend liberally,—the Standard Oil Company's

new building deserves notice. Just as the king of small-denomination-trading encouraged Cass Gilbert in the monumental design of the Woolworth Building, so it seems to be the policy of the master factors in the great economic necessities (such as oil) to "urge on" the rarely lucky architects designing their structures. Plans of the group of architects collaborating at the present time in the construction of the New York building of the Standard Oil Company are an instance of this tendency; and in the San Francisco commission Mr. Kelham is said to have had similar latitude. In the light of the liberty given him, much is to be said for the restraint which Mr. Kelham has exercised. The building is rich, if not opulent, and yet it is marked with simple dignity, as if one would say "I might do more, but why?"

Since the best material for exterior walls in California is granite, of which the supply is seemingly inexhaustible, it is natural to expect that the Standard Oil Company's building should be carried out in this material. Actually, the walls of the upper stories are not of granite, but of a clever terra cotta imitation, and it is, perhaps, a safe assumption that considerations of time, delivery and setting had more weight with the owners than the question of cost, when it came to this substitution; for in respect to labor in the local stonecutting and setting industry there are serious limitations.

Left, the Matson Navigation Co. Building; Bliss & Faville, Architects. Right, the Pacific Gas & Electric Building; Bakewell & Brown, Architects

Some adverse criticism has been heard regarding lack of color, and on overcast days the monotone of this building may be uninspiring, if not depressing. To answer this criticism it need only be pointed out that the architectural character is derived from anterior sources in which rigor or austerity is the outstanding quality. For one's subconscious mental reaction to this building is "Florence in the time of the *Palazzo Vecchio,* the *Bargello* and *Or San Michele.*" In these examples, color is the last quality thought of; the originals are forbidding to the last degree.

The Standard Oil Building has also been criticized because of the superposed stories above the bracketed cornice-balcony; scarcely valid, this, because rarely among derivatives from Italian models has there been produced so complete a unity between upper stories and shaft. This unity is brought about by the introduction of a story above the balcony and below the colonnade, which is exactly the same as the stories in the tall shaft below, even to the subdivision of the windows. A technician's trick, if you will, but certainly masterly. And to show this essential unity more vividly, one need only to glance at the many other buildings in which glorified penthouses rise above complete and finished buildings, in the form of loggias, arcades and "what nots," all of which tempt one to flick them off with the thumb and forefinger.

Some years ago, in a paper on the subject of "Burnt Clay's Share in the Reconstruction of San Francisco,"* the present writer had occasion to pay tribute to the Newhall Building, recently completed by Lewis P. Hobart, who was then a newcomer in

*The Brickbuilder, October, November, December, 1910.

San Francisco. To the same architect is now due credit for the Alexander Building. The site is small in area,—only 60 by 68 feet,—but the building is large in its significance. There can be no question that full consideration has been here given to the legitimate aims of the office building architect,—increase of rent and decrease of first cost and upkeep, which problems have been cleverly solved. Compared with some of the other and larger buildings, the offices here are not only well lighted but also well arranged to suit the majority of tenants. Modifications are possible at small cost. The type of fenestration is such as to insure flexibility, so that yet with this great lightness of effect the building has a solidity in structural sense rarely, if ever, seen in the more "heavyfooted" type of pseudo masonry wall construction of the Renaissance derivatives. Furthermore, of the buildings described this seems to be the most completely logical, in that all projecting cornices are eliminated, thus guaranteeing full penetration of light into the street, after the neighboring corners are built up to full height.

In the folly of pride, a small-town California paper not long ago paid tribute to the city's newest bank building in these intemperate terms of praise: "This will probably never be counted as one of those buildings which are eyesores in the community." I would be more modest and prophesy for the Alexander Building only that it is destined to be a lasting monument to the discrimination, sound sense and good taste of its author and its owners.

There is shown among the illustrations a "stunt photograph," showing Bakewell & Brown's Pacific Gas & Electric Building, standing up solidly in its place adjoining Bliss & Faville's Matson Navigation Co. Building. When the photograph was made the land for the former building was not even cleared of the shacks which stood there. Even at the time of this writing, the pouring of concrete in the basement walls is scarcely finished. The picture, as shown, is of the plaster model, a photograph of which has been combined with one of the site, care being taken in making the point of view, the direction of lighting, and the scale of the two pictures exactly coincide.

This Pacific Gas & Electric Building and the Matson Navigation Co. Building together occupy an entire block. The latter building was under construction when the plans for the former were begun. As soon as the scheme for a plan was settled, the next thought of the architects was to ascertain the dominant levels from the adjoining structure so that they would be carried through. Nor should it go unnoticed that here is one of those rare instances when an architect is so considerate of the public as to make the horizontal lines of his building harmonize with those of its neighbors.

But three buildings are described at length in this brief paper. Many others are well worth mention and illustration, did space permit. The Matson Navigation Co. Building, by Bliss & Faville (referred to here in just a word), the Balfour Building, the Federal Reserve Bank and other works of Mr. Kelham; the tower addition to the Oakland Bank, by Reed & Corlett; these and others are the record of an active period of large construction, the average standard of which will not suffer by comparison with undertakings of similar importance East or West.

California Commercial Union Building, Alexander Building, and Standard Oil Building, San Francisco

Office Building Vestibules

By WILLIAM F. LAMB
Of Carrere & Hastings, Shreve & Lamb, Architects, New York

WITH the same logic that led to building the gorgeous onyx hallways of Harlem, 30 or 40 years ago, architects are now advising their investing clients to show the best they can afford when the prospective tenant crosses the threshold of the building, and it is not very difficult to convince them that here, at least, an investment in beauty will bring a return many times over. The "onyx era" may have passed, but the logic is still good, and presents one of the very few opportunities in the interior of a commercial building when one may polish up the harness and drive one's thoroughbreds in the ring.

Marble, then, suggests itself for the walls, simple in color and simple in design; Botticino, travertine and many others, monotone in color, but with enough variety in veining and texture to give interest to the surface, the walls usually polished or very smoothly honed for the sake of cleanliness, and the floor of marble or terrazzo on account of the heavy traffic it must bear. One can see many examples of this treatment in some of the recent commercial buildings, especially in midtown New York, where the choice of materials and the restraint in employing them have produced results entirely in keeping with the uses and functions of the buildings.

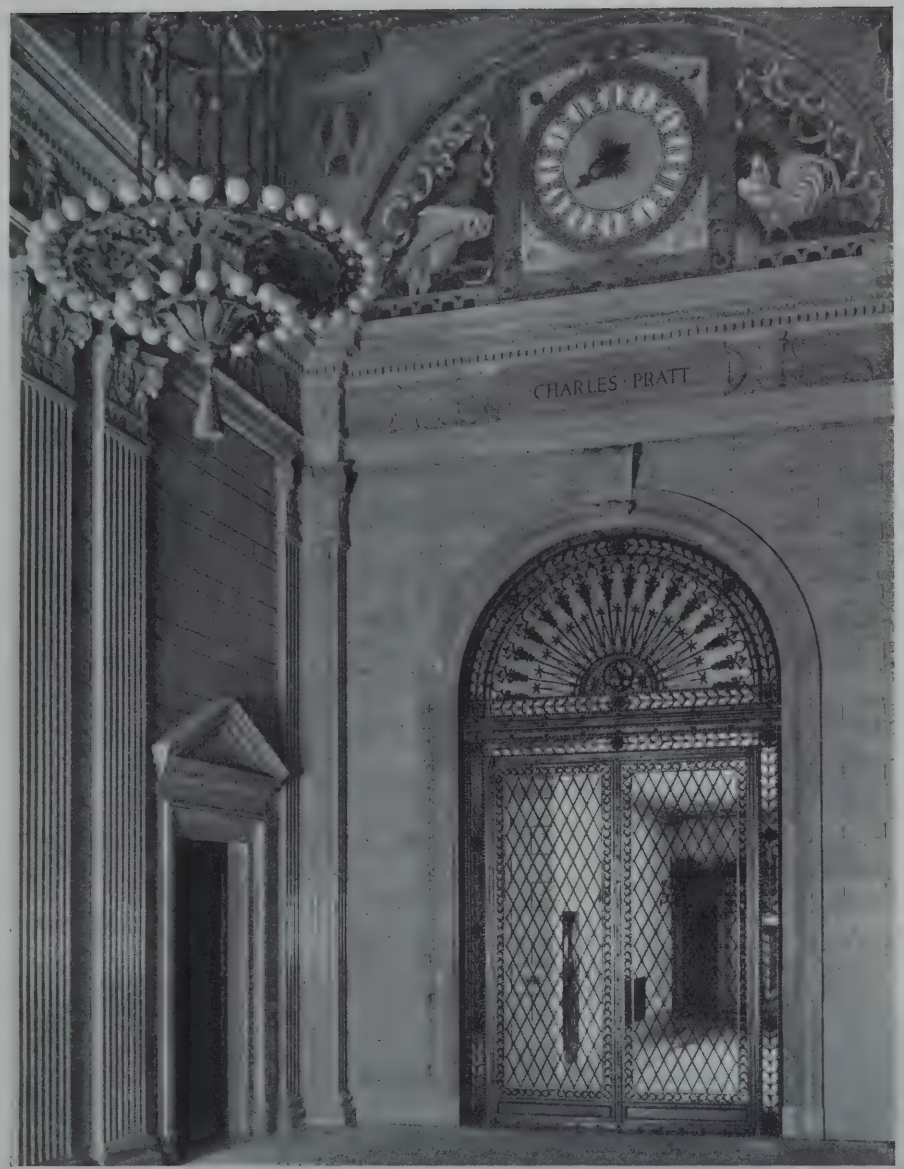
As to the practical side of the office building problem, there is one principle which is of the utmost importance. One must get the public from the street to the elevators with as little delay and confusion as possible. This means that the elevators should be as near the entrance as the typical floor plan will permit, and be so disposed that the confusion of traffic between those passing and those waiting for their cars is reduced to its minimum. The most satisfactory way to accomplish this is, in the case of large buildings having 15 or 20 cars, to divide these elevators into express and local groups, each in turn split up into two banks of four or five cars facing one another, and each group in a *cul-de-sac* off the main vestibule with illuminated directional signs to aid those unfamiliar with the building. In this way the vestibule becomes a real entrance to the floors above—a thoroughfare to the elevators and not merely their bottom landing.

With the decline of the stairway from its one-time great importance as a means of circulation to a purely necessary means of escape from the building, there are not many things left of which to take advantage as "focal points" of the design. The news- and cigar-stand is a thing to be seen and not heard and should be "built into the wall" to keep it out of the circulation area; a show window or the entrance into a store or a bank is not looked on with favor by the great majority of owners and should be introduced only after careful consideration; the building's directory and the mail box should both be easily accessible and convenient, the one because it is obviously necessary to have it so, the other because one is made to! But this lack of pegs upon which to hang garlands and cartouches is no disadvantage, for, with growing ideas of simplicity and directness, the *one* important thing is increased by the elimination of those things not essential. Dignified simplicity is much to be desired.

Walls, black and gold marble; elevator doors, trim and banding of marble walls in a gilded bronze. Floor in yellow and black marble harmonizes with and accentuates the rich tones of the walls

Lobby, American Radiator Co. Building, New York
Raymond M. Hood, Architect

The plan of the entrance hall of the building for the Standard Oil Company of New York shows the use of this "pocket" type of elevator grouping, the vestibule becoming a monumental hall leading from Broadway to New Street, with cross circulation at the central point leading on the one hand into the old building and on the other to what will some day be the entrance from a court on Beaver Street which will give access to the tower elevators. In this plan the hall is reserved entirely for circulation, and the elevators, except those at the New Street end, which are used for inter-floor service, are out of the way of the traffic, the elevator halls being made comparatively narrow to facilitate the answering of the up or down signal

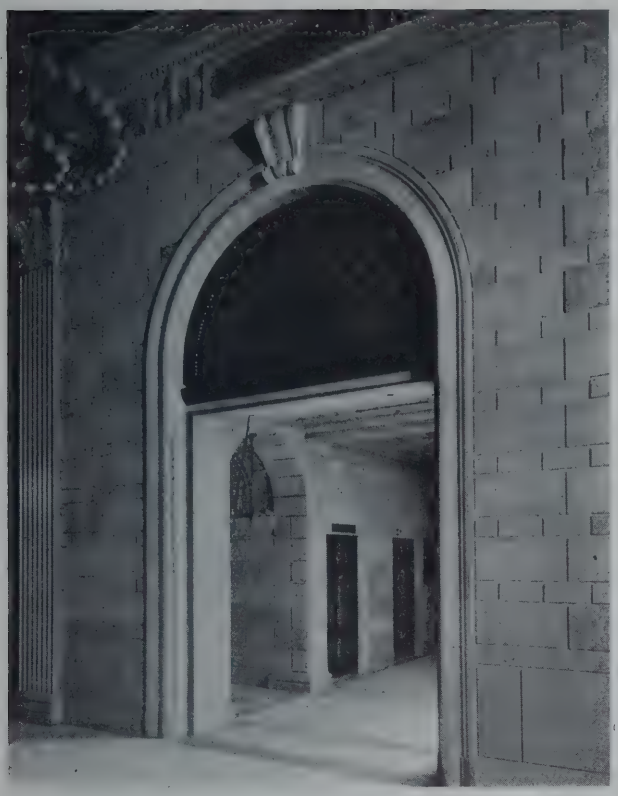


END OF MAIN ENTRANCE HALL

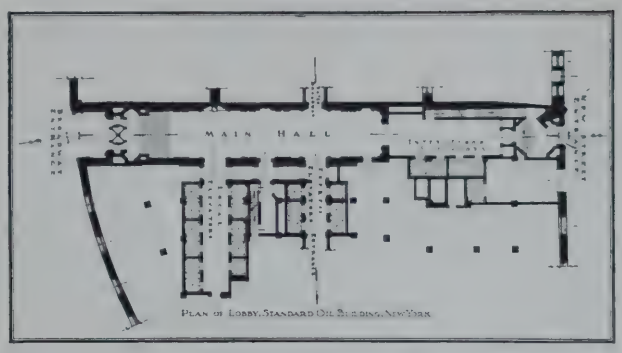
MURAL DECORATIONS OF ENTRANCE HALL BY MACK, JENNEY & TYLER

STANDARD OIL BUILDING, NEW YORK

CARRERE & HASTINGS, SHREVE & LAMB, ARCHITECTS



Doorway Leading into Elevator Lobby
Standard Oil Building, New York



Plan of Lobby, Standard Oil Building, Showing Hallway Extending from Broadway to New Street, with Connecting Elevator Lobbies

on the floors above, and simply treated in marble with decorated plaster ceilings. The main hall is also in marble—low toned rose and yellow—for the walls, and travertine bordered with black for the floors. Alternating arches and small square openings, separated by coupled Renaissance pilasters which with the entablature occupy about two-thirds of the height of the wall, form the motif of the hall, and the frieze above the cornice and the beamed ceiling are very richly painted in polychrome geometrical and heraldic designs. Free use has been made of wrought iron to give contrast and color to the walls and to accent the various entrances. The lighting is indirect by means of low-intensity reflectors behind the cornices, with the addition of two large hanging fixtures opposite each of the main elevator banks.

The Cunard Building, across the street, shows again, in its entrance to the office building proper, this same system applied to conditions which are more often to be met. Here the vestibule is a large square room, very simply and effectively treated in marble and plaster, which gives direct access to two groups of elevators of ten each, arranged face to face, and each group in its own "pocket." Confusion, again, is reduced to a minimum, and a scheme is logically thought out and then successfully treated.

A word may be added as to the practical details of the means of entrance to and exit from an elevator lobby, the focal point of circulation of an office building. An inner and an outer set of doors, each door about 2 feet, 4 inches in width, pivoted to swing without mullions, properly checked to prevent opening too far back, constitute the most effective main entrance protection. Grilles or gates, pocketed in entrance jambs when open for traffic, are provided for use when the entrance is closed.

Revolving doors have a value in preventing loss

Entrance Foyer, Cunard Building, New York
Benjamin Wistar Morris, Architect

of heat or excessive chilling of the entrance hall in cold weather. They have a use, too, where a very large number of persons tends to crowd the halls at "peak load" periods on the elevators, for in such a condition the controlled flow into the building through the revolving door may be more readily kept in desired lines and volume of traffic. Both swinging and revolving doors, which constitute the actual "entrances," are usually much lower than the full exterior opening constituting the entrance motif. The space above the doors then offers a most interesting opportunity for well studied fenestration, properly related to both the exterior of the building and to the interior proportions and lighting of the entrance hall. The heating of the immediate entrance vestibule is preferably by the indirect method, bringing in warmed air in sufficient volume through grilles in keeping with the design of the entrance; or radiators, if possible concealed, may be placed in enclosures where they do not obstruct the traffic or constrict the passage.

The treatment of the entrances to the elevators, that is, the hatchway doors, should be controlled primarily by the demands of utility; they should be fireproof and of little weight, so as to permit ease of automatic or manual operation, and in some cases in two or three leaves or sections, sliding at two or three individual but properly related speeds to permit a maximum width of opening even where the space into which the door is withdrawn is small. The steel door best meets these demands. The grille or gate is obviously not satisfactory, and the use of glass with it is even less so. Glass may well be omitted for the reason, also, that car schedules may be best maintained with the minimum of complaint from passengers when the operator is not watching the landings and the position of the car and its motion are not evident to the waiting passenger. The truth of this comment, which is not yet accepted by all, is made more apparent by pointing out that the operator should be guided solely by his car signal, where, indeed, the car is not automatically controlled, without discretion on the part of the operator; and similarly, the waiting passenger should get his information from the light which says, "This Car Down," and not from his observation of the positions and motion of the cars. Office building elevator systems are more effective when run as vertical railroads, automatically controlled, and not as jitneys.

It follows from these comments that the use of indicators should be limited to lights or signals showing which car, moving in the direction the waiting passenger wishes to go, is next to stop at the floor where passenger is waiting. Indicators showing positions and motion of all cars at all floors can be dispensed with, but whatever indicators are used should be so designed as to be readily distinguished, positive and legible.

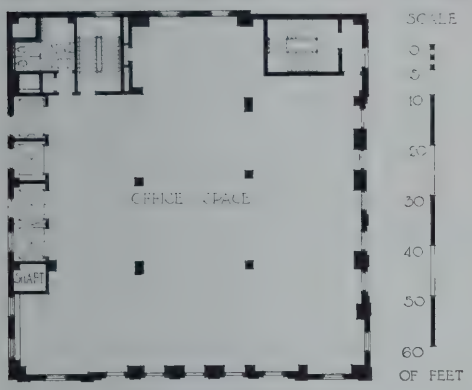
The hatchway entrance to the car should be treated or trimmed with material which will not easily soil or wear away through contact with those passing in or out of the car, and which has durability under the exacting conditions of hatchway door operation. Metal and marble are most largely used, the marble preferably polished. Painted surfaces are not useful. While doorway jambs are usually at right angles with the enclosing walls, the splaying of the jambs may sometimes secure better proportion in design, greater freedom of traffic movement, and increased visibility for operator and passenger. This is especially true where structural conditions affecting the hatchway wall create a deep reveal.

Entrance Foyer and Bronze Elevator Door, Straus Building, Chicago
Graham, Anderson, Probst & White, Architects

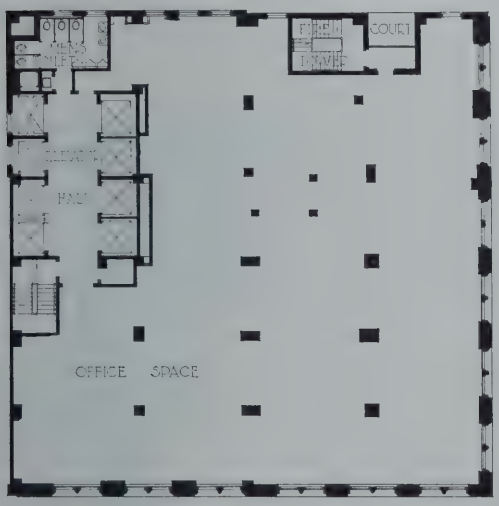
Johns-Manville Building, New York

LUDLOW & PEABODY, Architects

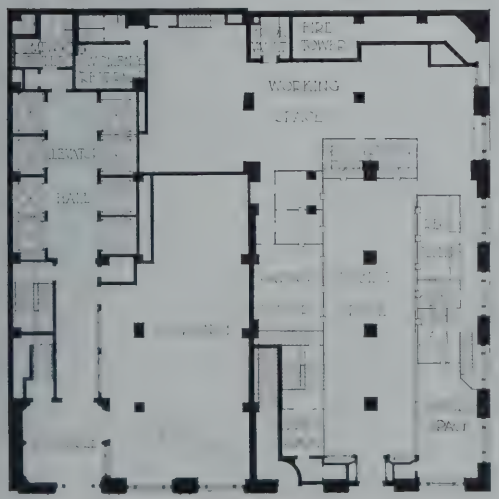
IN the Johns-Manville Building granite was used for the base course, limestone for the lower stories, and brick with terra cotta trimmings elsewhere. Construction: steel frame, with reinforced concrete slab floors. Heating: vacuum steam. Electric service furnished by service company. Elevators: 1-1 direct-traction, micro drive. Windows: solid steel, double-hung. Entrance lobby and elevator hall: walls and floor marble. All corridors: plaster walls, marble base, terrazzo floors in different colors.



Fourteenth Floor Plan



Typical Floor Plan



Ground Floor Plan

General View of the Building

Postum Building, New York

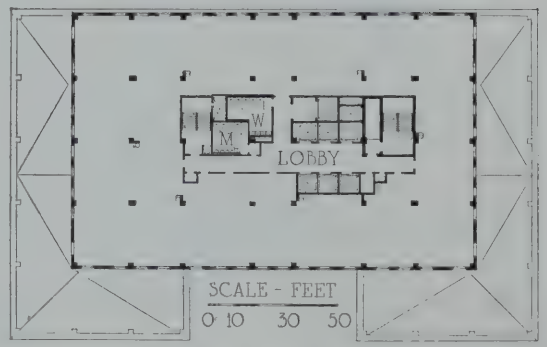
CROSS & CROSS, Architects; PHELPS BARNUM, Associated

Perspective Drawing of the Building

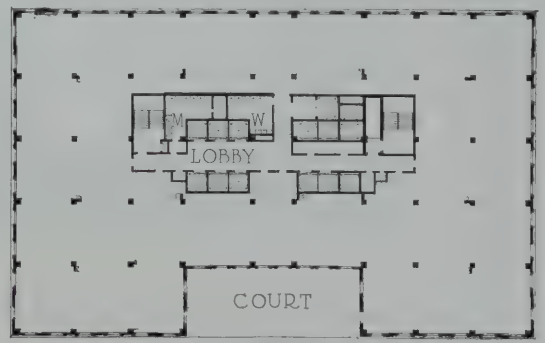
IN the Postum Building the use of projecting bays, and the central location of the elevators, stairways, toilets, and service, permit variety of arrangement of offices, all of which have outside light. As this building is located over the tracks of the New York Central Railroad, no basement is possible.

A low studded machine room, 28 by 40, with mezzanine floor for service, is located at the rear of the building. Limestone is used for the three lower stories, buff brick and terra cotta above.

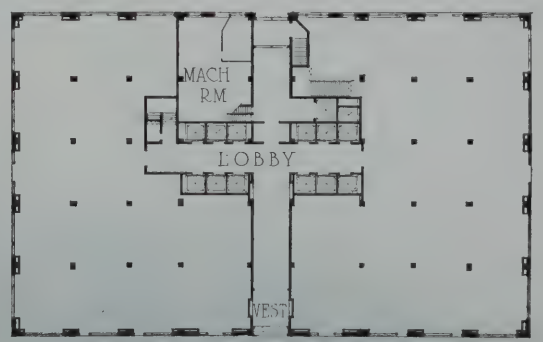
Construction: skeleton steel frame and solid brick walls, with cinder concrete arches for floors. Steam heat and electric service: 120-240 d.c. is supplied by the New York Central Railroad. Elevators: 1-1 traction; passenger cabs, walnut; service car, steel. Windows: solid steel double-hung. Entrance and elevator halls: walls, plaster with marble wainscot and floors.



Top Floor Plan



Typical Floor Plan



Entrance Floor Plan

Four-Story Substructure for a Steel Building

By FRANK W. SKINNER, C. E., New York

THE Barclay-Vesey Telephone Building, now being erected by the New York Telephone Company, occupies all of the city block between Washington, Vesey, Barclay and West Streets, New York. The plot is a slightly oblique parallelogram with sides of about 213 feet and 259 feet on curb line. To a height of 17 stories or about 262 feet above street level the building with setbacks and courts occupies the entire area of the site. The upper portion, about 100 feet square, extends 12 stories higher, 29 stories above the curb, or 33 stories above the lowest floor to a total height of 434 feet above the curb and 497 feet above the lowest floor.

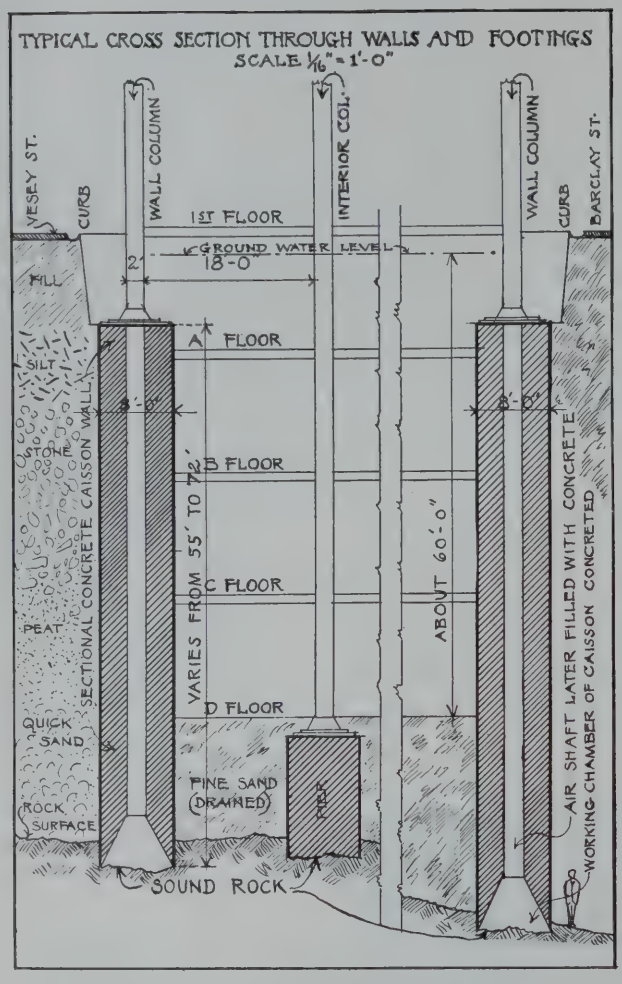
This steel skeleton building will be of the highest type of fire-resisting construction with protected framework and reinforced cinder concrete floor arches between steel beams. It will have a gross content of about 14,000,000 cubic feet, a gross floor area of 925,000 square feet in the superstructure, and will house about 6,000 people. The first story will be used for stores and other commercial purposes, and the remainder of the building will be occupied by the Telephone Company, the second to tenth stories inclusive being used for telephone equipment purposes, and the space above for offices.

The location, on made ground outside the original shore line of the Hudson River, the enormous weight of the building and contents, the high land value and the great depth to rock overlaid by saturated materials containing numerous obstructions, made the design of the substructure difficult and its construction slow and costly. In collaboration with the architects, McKenzie, Voorhees & Gmelin, the consulting engineers, Moran, Maurice & Proctor, made preliminary investigations of conditions, requirements and costs, and developed a plan involving advanced practice for securing deep foundations and providing for safety and rapidity of construction and for stability. The site was explored with 22 preliminary 4-inch diamond borings to rock which indicated the presence, below a large quantity of timber cribwork and filled material, of quicksand, muck, sand, boulders and rotten rock on the irregular surface of the bedrock at distances varying from about 60 to 80 feet below the high water level. Ground water level at the side is from 2 to 4 feet below curb elevation, and the soil is of a treacherous character with numerous obstructions and contains a highly compressible muck stratum about 2 feet thick at a depth of 48 feet below the curb. It was, therefore, felt that the conditions and requirements necessitated the adoption of the subterranean dam type of substructure, which consists of a continuous reinforced concrete wall enclosing all sides of the excavated area. This sectionally constructed wall extends down to solid rock bearing, supports the exterior columns, and, by excluding ground water and retaining the soil, permits free open excavation for all of the material removed for the lower stories of the building and for the foundations of the interior columns.

Scale Model of the Barclay-Vesey Telephone Building
McKenzie, Voorhees & Gmelin, Architects

Economic considerations demanded the utilization of the maximum amount of space below the street level, and four subterranean stories, A, B, C and D, are therefore, provided. The lowest main floor (D) is 59 feet below the curb, but the boiler and engine room floor is still farther depressed to a total depth of 63 feet, 7 inches below the curb, requiring, for purposes of drainage, etc., a maximum depth of floor excavation to 66 feet, 7 inches below the curb, below which rectangular pits from 10 to 20 feet square are sunk to rock in open cofferdams for the foundations of the interior columns.

The subterranean dam



Cross Section Through Substructure, Barclay-Vesey Telephone Building

enclosing the lower stories and serving as a foundation for the wall columns is composed of 22 reinforced concrete sections having a uniform thickness of 8 feet and lengths of about 40 feet. They were sunk by the pneumatic caisson process with clearance of about 18 inches below adjacent units, and were afterwards united by massive vertical concrete keys at each joint to form a continuous watertight wall. The uniform thickness of 8 feet is proportioned to the required strength and is 1 foot greater than would have been necessary if the full-size excavation had only been carried down two stories below street level. The length of the caissons is much greater than has generally been adopted for previous structures of this character, and was made, for economy, convenience and rapidity, as great as permissible by the approximate ratio of 1:5 for advantageous proportions of width and length.

From the indications of the exploration borings, approximate profiles of the rock surface at the lot lines were prepared, and the heights of the caissons were made sufficient to allow for that elevation. The stresses in the caissons were, however, computed to allow for a variation of 3 feet in the position of the cutting edge above or below profile elevation. At the corners of the lot the ends of the caissons were beveled to conform to the angles of the parallelograms, the other caisson ends being square. The caissons are substantially duplicates except for the variation just mentioned and for two caissons which were provided with rectangular cable openings through them, 1 foot below ground water level. All caissons were proportioned to resist sinking stresses, temporary and permanent outside pressures, and permanent combined banding and loading stresses. The maximum exterior pressures were assumed to be 2 tons per square foot of vertical surface, amounting to totals of as much as 2490 tons on a single caisson.

The entire area of the lot was excavated nearly to ground water level, and construction operations carried on simultaneously over the whole bottom of the pit without obstructing or being interfered with by the constant movement of a fleet of motor trucks handling great quantities of materials to and from the site, which loaded and unloaded on a temporary street level platform that covered a considerable part of the lot area and had entrances and exits on three streets. All parts of the lot were commanded by a system of heavy derricks rigged with 15,000 feet of 5/8-inch steel rope and operated by 19 two- and three-drum hoists, and eight swinging engines and a large amount of equipment were installed.

The caissons of reinforced concrete were built up in place as sunk alternately through quicksand and obstructions and into sound rock at maximum working pressures of 35 pounds in which work was continuously maintained in shifts, increasing with the pressure, up to ten in 24 hours. After adjacent caissons were sunk they were bonded together by full-height vertical concrete joints. The 20,000 yards of concrete in the caissons were mixed in two 1-yard machines and distributed over an industrial track to all caissons. The caissons, heavily loaded with cast iron ballast, were sunk from 55 to 72 feet to rock bearing in three or four days each, the 18,000 yards of spoil excavated from them being hoisted in buckets and dumped through loading hoppers to motor trucks that conveyed it, night and day, to the dump scows at the contractors' yard.

After the completion of the caisson work the general excavation was carried on over the whole area of the lot, which was illuminated at night by 500-watt flood lights. The quicksand was drained to a sump emptied by an electrically-driven centrifugal pump. The necessary exterior pressure on the caissons was resisted by enormous cross-lot timber struts in horizontal tiers that were successively placed as the excavation advanced. These struts resisted heavy pressure and were arranged to provide clearance for digging and hoisting and to eventually transfer their loads to the steel and concrete floors.

Compressed air for the working chambers of the caissons for hospital locks and for pile hammers and pneumatic tools was furnished by compressors having a combined capacity of more than 10,000 cubic feet per minute.

Office Buildings, Past, Present and Future

By CLARENCE T. COLEY

Manager, Equitable Building, New York

EVERY branch of finance, architecture, engineering, construction and mechanics, has been drawn upon to develop the beehive of modern American consolidated business efficiency. The development of office buildings during the past 60 years has been from a room in the home, where business was done by the head of the house. In time the business outgrew the private house and the "Inn." Business buildings and business centers were developed. The "Home" or "Inn" had its several rooms rented to others for business. The advantage of doing business in business centers and in business buildings was apparently economic and therefore grew, especially when transportation was very slow, by foot, horseback or carriage, and communication by mail.

In the early days each tenant cleaned, heated and lighted his own office. The sink and toilet were in the cellar or in an upper hall, after running water could be had. Next, the building's occupants clubbed together and hired a man to clean their offices, to light, trim and fill lamps, and to bring coal or wood for the open grates or stoves. As time passed, the landlord furnished these services. A light shaft was cut down through the center of the building and the offices were built around the shaft as well as in the front and back of the house. Natural light and air must be obtained from the windows. Everybody walked up and down stairs. The stair treads were covered with figured sheet metal to resist wear. Finally came the advent of the elevator in the light shaft, with steam engine-driven belts to drive a drum which wound up a cable attached to a wooden cab. The cab creaked, joggled from side to side, jerked its jumpy way up and down the shaft, while the control cable sawed the floor.

Inside the office one found the musty smell of stale tobacco ashes, and sooty chimney breasts and ceilings. Dust covered the floors, desks, tables. papers and books. Red and blue ribbons and sealing wax gave an official atmosphere. Black tin file-boxes lettered in gold, advertising the names of important clients and estates, impressed the caller. Dark oil cloth covered walnut tables, and flat top desks with hinged covers were in style. The tenants by coöperation determined what services they were to receive. Hot air furnaces and steam boilers came later as improvements to give comfort, save time, prevent dirt, and increase business efficiency. The great key for the safe was taken down from its hiding place over the door and tied to the safe handle to be moved out, to make way for the new style combination safe. There were no special facilities for women then, because very few women were employed in business buildings of any kind.

The introduction of steel frame construction, elevators, electricity, service of architects, engineers and capital, made the development of the skyscraper office building financially and structurally possible, and the limited business area and ground values made them develop skyward. The London building manager reports that 12 per cent net is a minimum return on an office building over there, where the legal height limitation permits 80-foot buildings. However, in every other way, American buildings have surpassed European commercial buildings, such as in height, service, appointments, stability of construction and practicability of design, as well as intensiveness of operation. Even so, it is hard to show a 12 per cent net average. This is because land, foundations and structures cost too much. There is a great deal of money needlessly spent in an attempt to make historical architectural forms, specially designed and constructed, meet the needs, when standard stock models could be used just as well.

The present-day building should be strictly a structure of utility, in which every cubic foot is constructed for intensive use and wear. Every piece of material used in construction must have a purpose to warrant its existence in the structure, and its cost and maintenance must be reckoned with, as long as the building stands. The best investments are made in office buildings that are useful and comfortable. Much money is spent and poorly invested, according to the writer's belief, in an attempt to make office buildings agreeable to look upon, beautiful and artistic, as it has been proved that space in them cannot be sold for any higher price. Some American architects admit that there is a lack of beauty in the tall shafts filled with similar windows from the top down to the show windows of the store fronts.

A great French architect, accustomed to the uniform heights of buildings in Paris, saw that there was beauty in the irregular heights of office buildings as they exist in concentrated New York business areas. The nearer the design of an office building comes to fulfilling its purpose, the more beautiful it is. Beauty must be studied and admired from a proper point of view to get a true impression of line, proportion and perspective. In congested areas, where office buildings stand on narrow streets, such view-points cannot be had, so why should money be spent on architectural ornamentation which cannot be seen and appreciated, which has to be paid for by the tenants? Americans are trying too hard, and at too great expense, to improve office building design by the use of the classic. The modern skyscraper office building is distinctly American, and

often contains elements of architectural expression which are effective and pleasing and beautiful, because of their great utility and durability, because of the materials used in construction, and because it is a financial success. Ancient architectural forms cannot be successfully followed if they do not answer requirements. An office building which is not a financial success, is a poor investment, and an object of pity and discredit to everybody connected with it. The style of office building design has undergone a great change during the last few years. The rate of progress has created a tendency to go too far, and to include many things which increase the costs of construction, things not at all needed and, therefore, neither appreciated nor desired by the tenant.

Future office buildings, except for special use, will be in large blocks, externally dignified, plain, of right lines and made up of standardized units of construction. The large building houses a great many business interests under one roof, where vertical transportation is more rapid than horizontal travel, and which tends to improve business efficiency. The grade "A" building is determined not by its design and construction, but by its occupancy. It is natural for business men to desire to do business with groups of highly respected and successful men. The more such men are housed together, the easier it is to meet them. There is also a certain confidence developed because of occupancy of space in the same building. Occupancy is a testimonial from the landlord as to a man's rating, which tends to produce a good rent rate. The cost of operation per square foot of rentable area is lower in proportion to the size of a building, on account of the spread of the overhead and the possibility of doing business on a wholesale basis.

Office buildings have a rather short economic life, which should always be borne in mind in determining the design and material to be used. The economic life is longer if the development is an adequate improvement on the lot, within the limits of the law, and if the material is strong and the relation between rentable area and gross area can be maintained profitably. Style plays an important part in office building design, as the simpler the style and the more popular its adaptation, the longer it will remain in vogue. Owners are trying to have their office buildings show individual characteristics, just as they try to do in the designs of their homes. This costs real money, and since the investment is a strictly cold blooded proposition, all sentiment should be eliminated, the building should be standardized and made up of approved and tested units. The owner and architect can establish a contact with the users of office space through the connecting link of the building manager. Through his experience with tenants and his efforts to sell space and his service to the advantage of the owner, he knows what can and cannot be sold. He also knows what materials last, and permit him to render the demanded service to the tenant. The building manager who is the man in the field is the only one to make accurate records of performances, by which the designers of new buildings can profit. Can anyone imagine an automobile manufacturer turning out a new line of automobiles each year without the coöperation of the man who tests the cars on the road, the service station, and the experts to determine where the weaknesses are, what the purchasing public is demanding, and what competition is compelling?

The office building managers are in a position to know the tenants' needs because of their daily contact with them. They have also had to work with the product of many architects' offices, and know what has good reason for its existence and what has not, and what should not have been installed, because it is too expensive to maintain. Thousands of dollars can thus be saved and invested elsewhere.

Better and less expensive buildings can and will be built, and more of the income will be available for returns on the investment, if a committee of building managers is called in to advise with owners, architects and engineers during the planning of the building and until the building is finished and operating successfully. Such advisory services are available through the Building Managers Association, established in all of the large cities of the country. A number of large office buildings recently designed and built have had the advantage of this service, to the satisfaction of both the owner and architect.

Skyline of the Business District of New San Francisco

The Pacific Telephone & Telegraph Co. Building, San Francisco

J. R. MILLER & T. L. PFLUEGER, AND A. A. CANTIN, Associated Architects

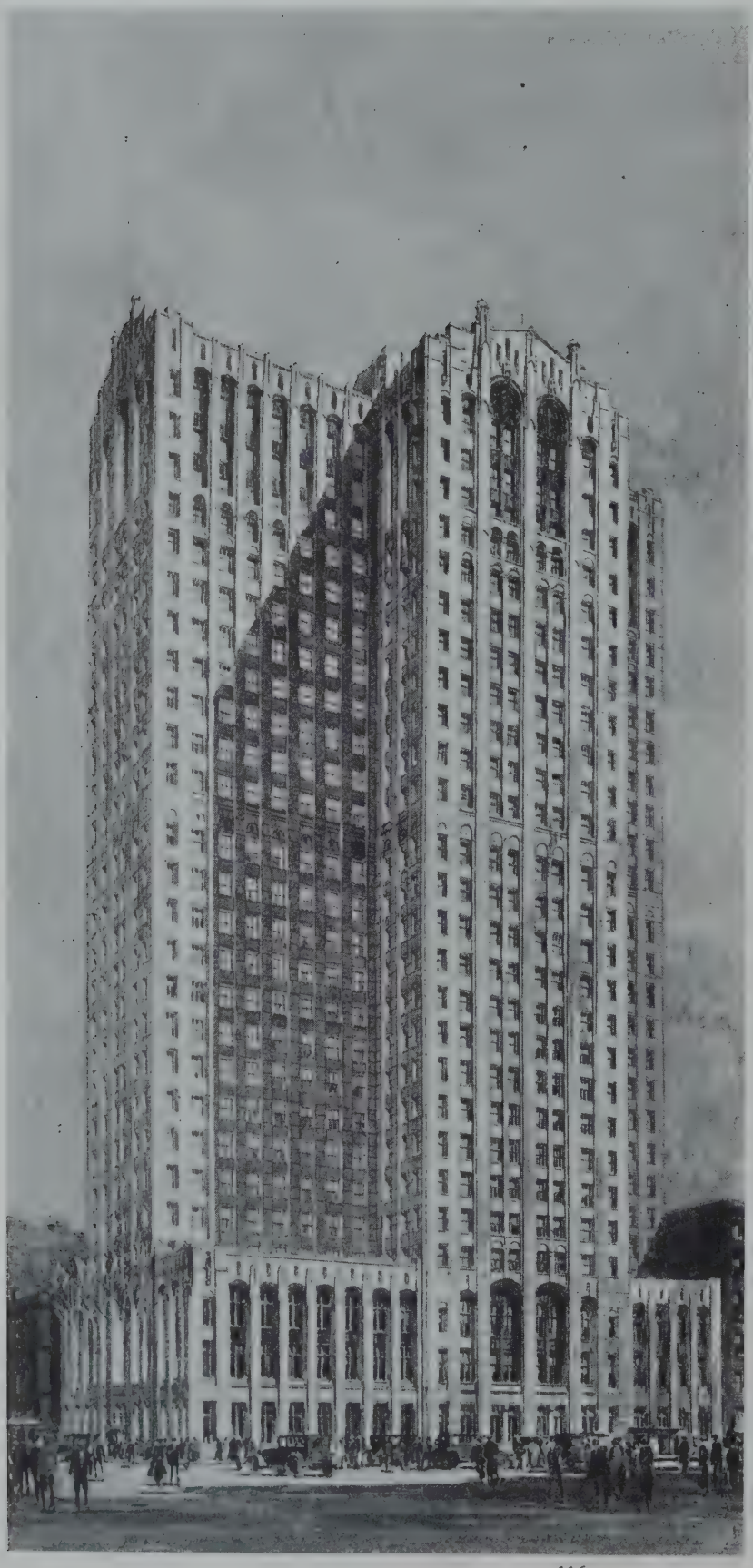
Elevation of Main Facade

Typical Floor Plan

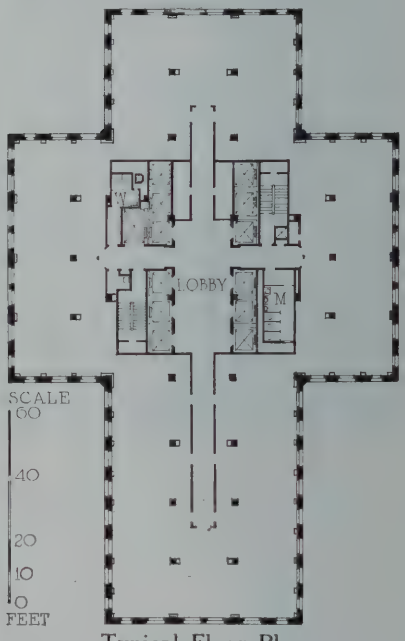
THE Pacific Telephone & Telegraph Building now being built in San Francisco, will cost approximately $3,000,000. Two sections of the building are being constructed at present, leaving a third section of the U-shaped structure to be erected in the future. The 26 stories and two basements will contain, among other features, an auditorium and a cafeteria for the employes. Terra cotta will be used for the exterior.

The Buhl Building, Detroit

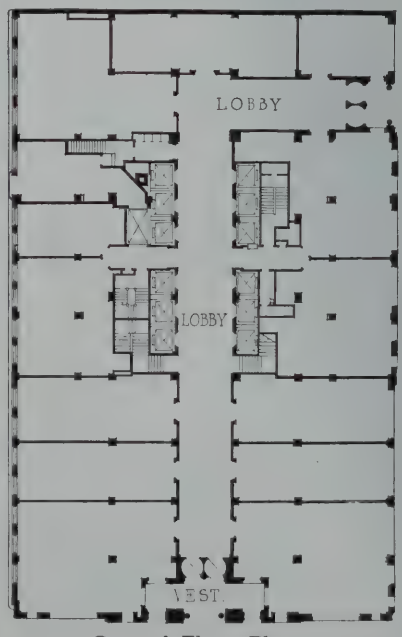
SMITH, HINCHMAN & GRYLLS, Architects



THE Buhl Building, Detroit, is unique on account of the unusual cross plan above the basement stories. Structural work of the building consists of caisson foundations, and steel superstructure, with a combination steel and concrete slab floor. Walls are faced with a special finish terra cotta laid in blocks of random sizes; granite base at street level. Top floors: cement; walls: plaster on tile with slate base; windows: metal, double-hung type. All doors and trim are metal. Elevator lobby and upper halls have marble floors and wainscots. Entrances to building are recessed and vaulted and are decorated with ornamental mosaic ceilings.



Typical Floor Plan



Ground Floor Plan

Eliminating Fire Hazards in Office Buildings

By RUDOLPH P. MILLER

President, National Fire Protection Association

IN considering the modern office building, a tall structure of fireproof construction generally comes to mind. As a matter of fact, however, in the majority of cases, that form of construction is not found. Even in so well developed a community as the Borough of Manhattan, an analysis of the building statistics shows that not more than two-thirds of the newly erected buildings which are used chiefly or in part for office purposes are of fireproof construction. If the floor area is considered, a better showing for the safer type of construction undoubtedly would be made. The records for a 15-year period in Manhattan indicate that of the new buildings for which permits were asked, about 27 per cent were of fireproof construction and 60 per cent were of ordinary, that is wood joisted, construction; but of the total floor area provided in all the new structures, 56 per cent would be found in fireproof buildings, 42 per cent in buildings of ordinary construction, and the rest, 2 per cent, in buildings of frame or unclassified construction. It is fair to assume that the ratios here given are about the same for office buildings.

Ordinarily the contents of an office building do not constitute any serious fire hazard, but the value of such contents may be incalculable. Not that there is any great intrinsic value to such contents, but the results from the loss of business records might be calamitous. So important has this matter of the protection of records become that the National Fire Protection Association has found it desirable to appoint a committee to study the subject. An interesting, comprehensive report submitted by that committee may be found in the Association's *Proceedings* for 1924. As the record losses are generally indirect and "there is a natural tendency toward reticence on the part of those who have lost records," the committee has been unable to give definite figures but hopes in time "to state the consequences of record losses in direct and indirect costs, inconveniences, interference with operations, loss of good will of customers, and the many other factors which properly apply." The protection of the contents of office buildings, therefore, is of vital importance, and accordingly as records become of greater value the fire-resistiveness of the building containing them must be increased.

Although the better form of construction is advocated for office buildings, nevertheless, a well constructed building of masonry walls and wood joisted floors may be made reasonably safe if suitable protection against the hazards from without and within the building is provided.

As we are not disposed to dispense with lighting and ventilation from the outside, the proper protection of the exterior openings, windows and doors, may perhaps be considered the first essential in the fire protection of an office building. The most efficient form of window suitable for office buildings is that of metal construction, glazed with wire glass. Such windows are made either of the usual window construction, that is double-hung sash, or of one of the several forms of pivoted sash. The latter form can be readily made automatically self-closing which, of course, is a decided advantage; for if a window has been inadvertently left open at the end of the day's business, there is still a high probability of protection in the automatic closing when the heat reaches that intensity which becomes dangerous. The effectiveness of the metal and wire glass window, however, depends on its proper construction. If the recommendations of the National Board of Fire Underwriters are complied with, the best protection afforded by this type is secured. The main disadvantage of the wire glass window is the ready transmission of heat through the glass itself. For this reason well constructed shutters, either of the swinging or the rolling type, are, perhaps, still the safer form of protection to use. Rolling shutters can be made automatic without much trouble. To make the swinging shutter automatic, however, is somewhat difficult. The disadvantage of shutters for the kind of building under consideration is that they are too frequently left open after business hours.

To check the spread of fire within the building, several things are necessary. Large interior floor areas are to be avoided in office buildings as in buildings of other occupancies. If the building is not of fireproof construction, interior walls of substantial masonry should be utilized to divide the building into sections of not exceeding 4,000 or 5,000 square feet in area. Building laws quite generally prescribe limiting areas for non-fireproof buildings, varying these according to the location of the building or the accessibility to the interior by the fire department. A building which faces on two or more streets is ordinarily allowed a larger undivided space than one that has only a single street frontage. In the building code recommended by the National Board of Fire Underwriters the proper limitations of area for non-fireproof buildings (not exceeding 55 feet in height) to be used as office buildings are given as 5,000 square feet when the building faces on one street only, 6,000 square feet when it is located on a corner or faces on two streets, and 7,500 square feet when it has frontages on three or more streets. These limits are fixed on the assumption that the building is not protected by an automatic sprinkler system. If there is such an equipment it is suggested that the limits may be increased by two-thirds of the areas specified. The

building ordinances of cities generally permit larger undivided areas. The interior partitions that are used to divide the building into small offices frequently accomplish the end sought by using fire walls, but not effectively if constructed in the usual manner with door and window openings.

When not needed as fire stops, it seems useless to make interior partitions of more fire-resistive construction than that which is used for the closing of the openings in such partitions. A hardwood door, thick enough to be regarded ordinarily as a heavy door, will undoubtedly offer considerable resistance to the spread of fire. The partition in which it is located, it would seem, need hardly be of a greater fire resistance. If window openings are placed in partitions, unless they are made of metal frames and sash glazed with wire glass in small panes, it is hardly worth while making the partitions themselves of fire-resistive construction except for the desirability of reducing the amount of inflammable material. Instances are not uncommon of fires having originated within a room of the size of the ordinary office in which the hardwood doors have sufficiently resisted destruction by fire to permit the contents to burn out completely without having the fire spread beyond the room.

Of the interior fire walls in any building, the most important undoubtedly are those that enclose the spaces devoted to exit facilities, either stairways or elevator shafts. Such partitions should be of the type of construction most effective from the fire-resistive standpoint. Door openings leading to stair enclosures or elevator shafts should be equipped with self-closing doors of proved efficiency. Any form of shaft construction or other vertical communication through the building, however, such as pipe and vent shafts, should also be thoroughly enclosed in substantial fireproof construction. The only reason why the stair and elevator shafts, perhaps, are more important is the fact that they afford the means by which the occupants of the building may get away safely in case of fire.

An important element in an efficient fire door of any type is the hardware with which it is equipped. Greater care is needed in its selection for doors in office buildings since appearance must be taken into consideration. The larger manufacturers of interior metal trim generally make doors with suitable hardware that meet the tests of the fire underwriters.

Of lesser importance than the items already referred to are the methods used in the structural elements of the building. Where economic conditions make it possible, a greater use of fire-resistive construction is to be recommended. Well constructed timber floors with double flooring, hardwood upper finish, and metal lath and ceiling protection have a worthy record. Floors of terra cotta or cinder concrete arches between steel beams are, nevertheless, to be preferred because of their higher efficiency rating. It must be understood, however, that in speaking of fireproof construction the encasing of any steel or iron that enters into the structural work is absolutely essential, including floor beams, girders and columns. Unprotected steel, though incombustible, is more likely to fail and collapse within a given time than well constructed timber work.

In spite of what may be done to make the building itself invulnerable to fire, there is still the hazard, small though it may seem in an office building, to the contents. Suitable provision should, therefore, always be made for extinguishment within the building. The most effective and, when properly maintained, most responsive means of extinguishing a fire in its incipience is the automatic sprinkler. Its record of efficiency is very high. Wherever it is possible, a system of automatic sprinklers should be introduced in an office building. There is, of course, some hazard to office records from leakage of the system. Proper care and maintenance will, however, minimize this danger. H. P. Weaver, of the Independence Inspection Bureau of Philadelphia, who has given the matter of the protection of records a great real of earnest thought, believes that the danger is overestimated and cites experiments made by his organization with ledgers submerged in water which after several days' immersion were still legible, although bindings fell apart. They would hardly have survived the ordeal of fire as successfully.

When office buildings attain a height at which it is difficult for a city fire department to reach the upper stories with its apparatus, standpipes, generally most serviceable when located in the stair halls, must be installed. Such equipment should have street connections to which the fire department may couple up and continue the flow of water after the supply in the tank attached to the standpipe has been exhausted. Hose outlets should be inserted at every story in the line of the standpipe and adequate hose to reach the farthest corner of any story provided.

In addition to these fixed forms of fire extinguishing apparatus it is well to distribute throughout the building ordinary 2½-gallon soda water extinguishers of types approved by the Underwriters' Laboratories, even though there may be an automatic sprinkler system. These should be so located in the corridors that they are readily accessible to anyone. Instruction in their use should be given as generally as possible to the occupants of the building.

In this brief outline of the fundamental requirements for fire protection in office buildings, details have been necessarily dealt with superficially. Successful prevention of fires is dependent on a close observance of such details in the planning, installation, maintenance and use of devices and forms of construction. Regulations giving full information and instruction, which have had thorough study by committees of experts, are freely issued by the National Board of Fire Underwriters. Close attention to these rules will undoubtedly reduce the fire hazard to a minimum.

Materials and Maintenance

By EDWARD VAN VLECK
Of Starrett & Van Vleck, Architects, New York

SECOND only to the impression made by an agreeable or depressing entrance hall of an office building, is the reaction on landing from an elevator on an upper floor. Well lighted elevator lobbies and corridors sufficiently spacious to appear to welcome rather than to imprison, with walls and ceilings of material in fairly light and cheerful tones, are important psychological factors in establishing in the public mind the attractiveness and desirability of space in buildings so favored.

It is generally impracticable in metropolitan office buildings to obtain outside light for elevator lobbies and corridors on upper floors, and, with the necessity for permanent artificial light, greater care must consequently be taken in the selection of materials, with particular reference to their color, when expense and durability have been passed upon. In reviewing the practicable materials for corridor floors and walls, the first consideration is quite generally that of the cost, with the factor of durability always in mind, together with the cost of maintenance. Æsthetic considerations are often, unfortunately, subordinated to these controlling factors. It by no means follows, however, that it is necessary to use the more expensive materials in order to render lobbies and corridors attractive to the average visitor or the prospective tenant. It is the writer's belief that harmonious colors, adequate lighting and meticulous cleanliness have far greater weight than the lavish use of costly materials.

On account of the fairly permanent character of elevator lobbies on upper floors, it is permissible and in fact desirable to use more expensive material than may be found practical and economical in the distributing corridors, where a likelihood of frequent tenants' changes must be taken into consideration. A marble wainscot to the height of the elevator door heads will be justified, with a floor of travertine, marble, or high quality terrazzo laid as metal stripped tile,—the travertine being preferable at elevator landings on account of its non-slipping qualities. For office corridors, however, the character of occupancy changes so frequently, with a constant shrinking or expansion of corridors in length and occasionally in width, that permanent floors may prove an extravagance in replacement and patching. More and more it has become the practice to extend cement floors continuously over the rentable area of office space throughout the building, including all corridors excepting permanent elevator lobbies; all subdividing partitions, saddles, floor coverings, etc, are erected or laid over the finished cement floor and can be readily removed without cutting the cement. For corridors, soft tile has become justly popular, as it is not expensive, wears well and can be easily repaired, removed or extended. There are several acceptable tiles of this kind on the market—rubber or cork compositions. These floors are practically noiseless, which gives them an added advantage over marble or other hard floor materials, especially when adjacent to private offices. In any case, the base in corridors should be of marble, or if of wood or steel, should have mop strips of marble or bronze so that paint or varnish finish will not become soiled or marred by the frequent cleaning of floors. Saddles for office corridor doors are preferably of bent or cast bronze, bolted to the cement floors so as to be easily removed when tenants' changes are made.

Office corridors and subdividing partitions may have painted or enameled dadoes, which require frequent repainting, as they are generally subject to hard usage. The likelihood of frequent tenants' changes and the cost of marble wainscoting, however, are more than likely to offset in the owner's mind the higher maintenance of the painted walls.

Many owners object to the use of interior windows or "borrowed lights" as they are generally known, in the corridor walls of offices, the chief purpose of which is to gain natural light for the corridors. If they are not used, a considerably increased amount of artificial light is of course necessary, and more care should be given to the long corridor walls to render them attractive. Where borrowed lights are used, it is the general practice in some cities to set them on the transom lines of the doors, about 7 feet, 6 inches above the finished floors. The writer, however, considers that better light is obtained if they are set about 5 feet, 6 inches above the floors.

Toilet rooms should have impervious floors of ceramic tile or terrazzo subdivided with brass strips, with sanitary cove bases either of ceramic tile or terrazzo or a plain marble base. Wainscots should be provided of glazed tile or marble of a height at least to receive the highest adjacent fixture. Stallwork should be of marble, with back and wall slabs of the same material of a height sufficient only for adequate privacy. Excessive height and heavy capping of marble stallwork are not desirable. The stalls should be of ample width and depth with doors opening in, if possible, so that occupancy may be seen at a glance.

The material and finish of stairs, platforms and stair halls, as well as the ease of their rise and tread, will depend upon whether the stairs serve as fire exits only or are to be used for frequent intercommunication. For fire stairs, bent steel nosings and cement-filled treads and platforms, with cement floors and slate or cement bases for halls, are adequate. Steel nosings used on intercommunicating stairs become polished and are dangerous, and for

such stairs either soapstone or similar material having non-slip qualities should be installed or a cement tread provided with ample safety treads of metal or alundum tile. Unless stairs are in exposed locations, where an ornamental character may be desirable, the strings and balustrades should be of simple design with few or no scrolls or mouldings, for sanitary reasons and to reduce the upkeep cost. Handrails of enameled steel pipe require less attention than those of bronze, or brass tubing or wood.

Cement is the most economical material for office floors, and if properly laid is favored by the underwriters with a minimum rate. It may be hardened by the application of various compounds and may be improved somewhat in appearance, but not in durability, by color; but like all hard floors, it is uncomfortable under foot, and should be covered with a soft material. From a utilitarian standpoint, linoleum is the most popular material for floor covering in offices, large and small, on account of its soft composition, sound-deadening qualities, low comparative costs and ease of installation and repair. Where a better appearance is required, linoleum or rubber laid in tile form combines the advantages of a plain linoleum with improved color effect at about 50 per cent increase in cost. In some cities wood floors are still largely used on account of local custom and prejudice in their favor. They are, however, expensive to properly maintain, and in many instances are prohibited by law for large fireproof buildings, and are being less used each year.

For wall painting there are numerous flat wall finishes on the market, generally oil paints, but less expensive than white lead paint and more economical for interior work on plaster surfaces. They are more sanitary and lasting than kalsomines and cold water paints, and may be had in gloss finish for dadoes.

For exterior windows, plate glass should be used. The sash of office building windows are usually large, seldom subdivided by muntins, requiring large lights procurable only in plate glass. There is not distortion of vision such as is frequently the case even with better selected sheet glass. The exterior appearance of the windows is much better on account of the absence of waves, and the breakage is greatly reduced. Plate glass is also desirable for transoms and for interior windows above the line of door heads, although a high quality sheet glass is not objectionable in these locations. For the glazing of doors and interior windows at a lower level, where not required by underwriters to be of wire glass, some attractive form of obscure glass may be used, with prism, plain figured or stripped surfaces. Ease of cleaning, as well as cost and appearance, must be kept well in mind in selection.

Bird's-eye View of Surroundings of Bush Terminal Building, London
Helmle & Corbett, Architects

Economic Factors of the Office Building Project

By LEO J. SHERIDAN
Chairman, Building Committee, S. W. Straus & Co.

THE provision of desirable office facilities at prices which will me reasonable to those demanding such facilities and which at the same time will bring an adequate return to those who have been instrumental in supplying them is the fundamental economic problem of the office building business. The return must be ample to attract adequate capital from other opportunities for investment or the supply of office space will not equal the demand, and rents will rise to abnormal heights. Because of the huge capital investment in the modern office building, the relatively long period which necessarily elapses between the initiation of a project and the time at which the resultant office space becomes effective supply in the market, the relative permanence of the building once it has been erected, the frequent changes in architectural or engineering practice and in the character and rate of city development, and the comparative difficulty of ascertaining actual supply and demand conditions in the office space market, it is not easy to secure that nice adjustment of supply and demand, costs and prices, investment and return, which is possible, for instance, in the production of steel or shoes. Obviously, therefore, it is doubly important to give the most careful consideration to the economic factors involved. If the economic purpose of the business is to be served and if vast economic waste is to be avoided, economic considerations must receive at least as much attention as is given to architectural design and engineering standards.

Before any commitment whatever is made, the *entrepreneur* who has conceived the idea of erecting a modern office building should institute a careful economic survey of the city and district in which he proposes to build in order to ascertain whether there is now and will likely continue to be a demand for the proposed additional space sufficient to insure the financial success of the undertaking.

The basic economic factors responsible for the city's present size and prosperity—location, natural resources, industries, transportation facilities, labor supply, power costs, etc.—should be studied in order to arrive at an intelligent judgment in regard to the probable nature and extent of future growth. Total net rentable office area and percentage of occupancy should be secured for a period of years in the past and an attempt made to correlate the city's office space requirements with its population, its bank clearings or bank debits, and other indexes of business activity. Investigations seem to indicate that the average requirement of office space is 3.9 square feet per capita in Detroit, 6.5 square feet in Los Angeles, and 6.4 square feet in Chicago. Another study, based on 12 Southern cities with a population around 300,000, indicated 4½ square feet for each inhabitant and 1 square foot for every $1322 of bank clearings. Present conditions of supply in the office space market should be determined by listing all buildings now offering competitive office space, with their net rentable areas, vacancies, rental schedules, etc., and all new or remodeled buildings with the net rentable areas which they will throw upon the market when completed. On the basis of past experience and present conditions, a conservative calculation of immediate and future office requirements may then be made. Reasonable allowance may be made for space now on the market which is "on the margin" or practically obsolete and which would cease to be a competitive factor if more desirable space offering the most up-to-date service at reasonable rates were available. In the case of an ordinary office building, catering to the general class of office tenancy, there should be a reasonable expectation that the building could be filled to about 70 per cent of capacity within a year after its completion and to about 90 or 95 per cent within two years of that date. Specialty buildings catering to specialized classes of tenants, particularly where, as in the case of medical buildings, expensive equipment is necessary, should be well rented, say from 60 to 70 per cent, before the project is started.

In estimating the logical rental income to be expected, the rates for equally desirable space in neighboring buildings will be the best guide. Reasonable allowances, however, may be made for difference of attractiveness in connection with any or all of the six features of an office building which tenants regard as of outstanding importance: (1) convenience of location; (2) imposing structure; (3) equipment and flexible, well lighted layout to add to their convenience and meet efficiently their requirements; (4) atmosphere and environment which come from the association of tenants of high character; (5) efficient, pleasing service; and (6) attractive rental rates. In developing the rental schedule, the degrees of attractiveness of different space units will need to be considered. Space on the upper floors above "the dust and insect line" will carry a higher rate than that on the lower floors, while the better light and the prestige value of the outside and especially the front offices will give them a higher rental than those with court or alley exposure only. Slight differentials in rate may also arise as a result of the quantity of space bought by any individual tenant.

If the preliminary economic survey indicates that the city offers an adequate demand for the facilities of the general type under consideration, the next step is to continue the survey in order to

obtain the best possible site for the proposed structure. The selection of the proper site is fully as important as the correct answer to the question of supply and demand, for the economic wastes due to buildings which are misplaced or unsuited to their surroundings are just as serious as those due to over-development or to too rapid discounting of the future. As a building usually secures the best results when it is surrounded by structures of a similar type and use, the particular site chosen should be in a section which is well defined as the high class office building district. This will usually be found *in* or, perhaps in the majority of cases, *near* the best retail section. Accessibility to transportation facilities and to the financial center is also essential. If legal tenancy is to be encouraged, proximity to the city and county buildings will be desirable. Care should be taken to see that the particular improvement which it is proposed to put on any specific site represents the most advantageous use of that location, not only for the present but also during the entire life of the building. The past history, present stability, and future prospects of this office district should be studied to determine whether there are fundamental economic, social or legal forces at work which will tend to shift the office business away from it. It is obviously dangerous to build in a location from which business is moving away or from which it may move away in the early future. It is also dangerous to pioneer in a new district unless one is absolutely certain that the trend of municipal development is in that direction. It is true, however, that an important building of pleasing design, efficiently planned and efficiently managed, may dominate its neighborhood and act as a magnet in drawing similar businesses to its locality. The rewards of successful pioneering of this type in appreciation of land values are exceedingly attractive, but daring should be tempered with judgment if heavy operating losses are not to be feared in the early years of the venture.

PERCENTAGES OF RENT TO GROSS SALES FOR VARIOUS CLASSES OF RETAIL STORES

Automobile agencies	2
Automobile accessories	10
Barber shops	$20 to $25 per chair
Books and stationery	8
Candy and refectory	8 to 10
Cigars and tobacco	7 to 10
Clothing:	
Women's cloaks and suits	6 to 10
Men's clothing	6 to 8
Credit clothing stores	8
Dental and medical supplies	5
Drug stores:	
General	8 to 10
Prescription	10
Cut rate	7
Electrical appliances	6 to 8
Five- and ten-cent stores	5 to 8
Florists	15
Furniture:	
Household	7 to 8
Office	5 to 7
Grocery stores	5 to 6
Haberdashers	8 to 10
Hats, men's:	
General	8 to 10
Low priced hats	6 to 7
Hosiery and knit goods	10
Millinery	10 to 12
Musical instruments, pianos, etc.	12 to 15
Restaurants	8 to 12
Rugs	7 to 8
Shoes:	
Men's, women's and children's—mixed prices	8 to 10
Men's shoes:	
Mixed prices	7 to 8
One and two prices	5 to 6
Women's shoes:	
Mixed prices	8 to 10
One and two prices	5 to 7
Tailors—men's	6 to 8
Trunks and leather goods	12
Women's wear	10

The most successful office building today is not a structure which is used wholly and solely for offices. It is one which draws the maximum possible income from its ground floors by leasing them for retail purposes. In fact, a general rule used by many experts in obtaining a site is that in order to be a financial success a tall building upon the proposed site should be able to earn from the leasing of its ground floors and basement space sufficient to pay taxes and a reasonable return upon the cost of the land. Some experts go so far as to demand that the taxes on the first floor of the building should also be covered; others hold that the income from the basement, first floor and second floor should cover the return upon the cost of the land plus the taxes on the land and that portion of the building. Undoubtedly this rule, in whatever form it may be stated, has varying validity in different cities, and in any case should of course be used only as a very rough guide in the light of actual experience in the particular city. It does, however, indicate the importance which should be attached to squeezing the last cent of income out of the ground floor space.

As retail shops almost invariably pay the highest rentals, the possibilities of different available sites as locations for high class retail shops should receive the most thorough investigation. These possibilities depend upon a large number of factors—ease of access, traffic conditions, width of street, conditions of sun and shade, character of surrounding improvements, class of tenants in adjacent properties, contemplated improvements, etc.—and can probably best be determined by a count and an analysis of pedestrian traffic passing the site, although, where the district is old and well established, the class of tenancy best suited to it is probably fairly well determined by the occupancy of adjoining buildings. The technique of pedestrian traffic counts is now well established. Usually, however, their interpretation is less scientific and authoritative. It is the purchases made by and not the number of people who pass a given site that determine its value. The composition of the traffic (for instance, whether men or women) and the mental attitude of the passersby (for instance, whether leisurely strolling, or rushing to work, or to catch a train) are, therefore, of vital importance. Hence, a careful analysis of the count must be made to determine what proportion of the people who pass the store *enter* the store, what proportion of those who enter actually buy, and what is the average purchase of those who buy. Upon the basis of such an analysis, the precise type or class of shop which is best suited to the location can be determined. With the number of purchases and their average

purchase determined, it is possible to estimate the gross annual sales, and knowing the percentage of rent to gross sales which the particular types of business can afford to pay, it is a simple matter to calculate the rentals which could be obtained from them. The percentage of their gross sales which various classes of retail establishments can afford to pay in rent is now fairly well known by experience, and data for a rather complete list of such establishments are presented in a table included upon page 122.

The procedure indicated is one followed more perhaps by the chain store real estate experts in establishing the rental values of stores than by building owners and operators. In a well defined district the rental value of ground floor space can be fairly well determined by the rents being paid either on a square foot or front foot basis for similar space in the same general locality, making allowances for special advantages or disadvantages of the site and its improvement. Building owners have not been slow, however, to sense the fairness of percentage leases, and are adopting in many cases a form of lease providing for a guaranteed minimum rental and a percentage of the gross business over a certain stipulated amount. In the Straus Building, Chicago, all of the space on the ground floor, with but one exception, where a percentage could not be applied, has been leased on such a basis. In one case, for instance, a shop was rented to a class of business which can afford to pay 10 per cent of its gross income for rent. The minimum rental was established at $20,000 per annum. On gross sales in excess of $200,000 the lessee pays an additional 10 per cent. This procedure guarantees to the building owner a certain definite established rental, which he is assured from year to year regardless of business conditions, provided financially responsible tenants are secured; it enables him to share with the tenant the increase in the value of the space during the term of the lease.

Before purchasing any lot, it is of vital importance to pay particular attention to its shape and size. If the area is too small or the frontage too narrow, it is impossible to improve it intensively enough to secure for the owner a return not only upon his building but also upon the land for which he has probably paid a king's ransom. The "vertical toothpick," like the inside lot office building, has rarely proved an economic success. Costs of construction are necessarily higher because of the disproportionate amount of enclosing wall; a moment's calculation will show that a building 100 by 100 would bring a saving over a structure 70 by 143 of nearly 15 per cent in the cost of constructing the exterior walls alone. Further, as the floor area is increased, the percentage of unproductive area (i.e., for elevators, stairways and other service facilities) decreases, and the operating cost per square foot declines. Generally speaking, the larger the lot and the more nearly it approaches a square in shape, the lower the unit cost and the greater the efficiency of rentable space. Ordinarily, net rentable area runs to from 60 to 70 per cent of total lot area and from 70 to 80 per cent of gross building area. If, therefore, the lot is too narrow or too small for profitable development, the promoter should look elsewhere, or else endeavor to combine it through sale or lease with other adjacent property. He should also avoid the frequent economic blunder of attempting to develop a lot that is too irregular in shape. Too often these result in too high a construction cost and too heavy a wastage of net rentable area and make it difficult if not impossible to give the tenants offices that approximate the ideal in size and shape. No general rules can be laid down for the solution of these problems of size and shape of lot. In many cases it will be advisable for the prospective buyer of a lot to ascertain from his architect whether the particular lot will lend itself to a good plot solution, and whether at the price asked under the given local conditions it will warrant the contemplated improvement.

There has been much discussion of the economic limitation on the height of office buildings, the prophecy having been made that "the day of the Equitables has passed." It is true that after a certain point a stage of diminishing returns is reached. As the building soars skyward, the cost of construction increases because of the heavier supporting columns, larger pipes, etc., which are required and the expense of hoisting materials, while the net rentable area decreases because of the greater wastage in elevator space and other service facilities. The space used for, and the service given by, the elevators constitute another and perhaps more effective limitation upon building heights. Good elevator service, it is often said, requires one elevator for every 20,000 to 30,000 square feet of floor area. This, like the ground floor formula already discussed, is a rough rule of thumb which is helpful in determining an original layout, but after the plans begin to take shape, elevator requirements should be determined only after a most careful study of the traction problem involved. Specific information in regard to such factors as the probable population of the building, the probable square foot area per person, the character of occupancy, the probable traffic from outside the building, the location of toilets, the probable peak load, etc., should be obtained, and with these data as a basis the number of elevators required to make possible a satisfactory time interval of 25 to 30 seconds between cars during the rush periods can then be determined.

If after a certain point the addition of another story or two makes necessary another elevator to give this type of service, the additional space has to carry the burden of that elevator installation plus the loss of rentable space on every one of the lower floors. But the limit imposed by such factors is much more remote than most of the critics of the skyscrapers seem to imply. A study of 185 build-

ings reporting to the National Association of Building Owners and Managers * in 1921 showed that gross income and net income increased with the height of the building to the full limit of 24 stories, which was the tallest building reporting. There can be no doubt that upon the land of high value, the economic limit would be much higher than 24 stories. It is clear, for instance, that if the average building obtains, say seven-tenths of a square foot of floor area per floor for each square foot of lot area, and if there were no increase in cost or in wasted space as height increased, the 30-story building would have 21 square feet and the 20-story building only 14 square feet of rentable area upon which to earn a return upon the investment in each square foot of land. Now, cost of construction and waste space will be greater, but, as Mr. Earle Shultz has pointed out, if the lot is of sufficient size, the height can go up to a very great extent before the increased investment in the building per rentable square foot will by any means absorb the corresponding reduction in land investment per rentable square foot. Of course, if the lot is of small size, the economic height will be reached much sooner. In all cases, the promoter should assure himself that the structure he proposes to erect will represent an "adequate" improvement of the site, that is, an improvement which will reflect the highest utility of the site and bring in the maximum net income over the entire life of the structure. The high values of land in the office building districts of our larger cities demand the most intensive utilization of that land, if the total investment is to yield a reasonable profit to its owners or investors.

Building code restrictions in the particular city and the necessity of protecting light and air will always complicate the decision in regard to the proper architectural planning for any particular plot of land. Into the details of building codes there is not the space to enter. Suffice it to say that they have an important effect on building costs and the possible economic development of any particular site which the owner and the architect should very carefully consider. As the value of any site is determined by capitalizing the net return from the improvement upon it, building restrictions which limit the character of the improvement will set definite limitations upon the value of the land. Even in the absence of legal requirements, however, strict economic considerations would dictate the subservience of other desiderata to the necessity for proper lighting and adequate ventilation. For no defect detracts so much from the rentability and income producing power of a building as office rooms that are poorly lighted and ventilated. Hence due attention should be given to the maximum proportion of the lot to be covered by the structure, to the shapes and sizes of light courts, and to the character of reflecting surfaces. The utmost care should be taken to prevent the likelihood of other tall buildings being built which would cut off the supply of light and air and thus cause a heavy reduction in the value of the proposed building. For this as well as other reasons, corner lots are almost invariably utilized for first class modern office buildings. The very large proportion of poorly lighted and poorly ventilated space in the office building erected on an inside lot has in almost all cases condemned it to a life of financial difficulty. In some cases the promoters of skyscrapers have considered it economically profitable to secure light easements or actually to buy up one or two of the adjoining interior lots or low buildings adjoining the site in order to block the erection of other high buildings and prevent the rapid obsolescence which would otherwise be the fate of their own buildings. Similar attention must be given to the proximity and character of adjacent buildings if the proposed investment is to be protected against exterior fire hazard.

Another physical characteristic is of importance in the original selection of the site, namely, the character and depth of the subsoil. The tremendous weight of the modern 20- or 30-story office building demands that the utmost attention be given to the nature of its supporting foundations. Anything but the very best engineering theory and practice in the solution of this foundation problem and anything but the most rigid supervision and inspection of the underground construction will ultimately mean, at the worst, disaster; at the best, heavy expenditures to maintain the superstructure in proper plumb. In no other part of the project is apparent economy so likely to be false economy. The problem, of course, varies in different cities and in different sections of the same city. Where solid rock or "hard pan" is found near the surface, the solution is simple and relatively inexpensive. Where, however, as in Chicago, the solid rock is found 100 feet or more below the street level, heavy concrete caissons must be sunk. Where, as in New Orleans, no rock is to be found, pile foundations have to be used. Frequently, reliable information regarding proposed foundations may be secured by ascertaining the conditions encountered on adjacent structures. Otherwise, it may be advisable to dig test pits or to make wash or core borings. The owner should ascertain just what his liability is in regard to shoring in the particular city, and he should not forget that if the lot is already improved with a reinforced concrete building it may cost almost as much to demolish and clear it away as it did to build it.

The importance of this discussion is simply that modern conditions impose a rather heavy expenditure upon the builder before the work of erection in the strict sense may actually begin. This expenditure may vary considerably as between available sites. Other things being equal, the site which will involve the lowest expenditure for excavations and foundations should obviously be selected. Incidentally, if the underground expenditure is heavy, the advisability of constructing below ground

*See Bibliography, page 159.

three or four stories should be considered; these may be used for storage as well as for necessary mechanical equipment. In the new Straus Building, where the sub-sub-basement covered only a portion of the lot area large enough for the power plant, all caissons were cut off at the floor level of the sub-sub-basement and the steel set on grillage at this level. This will greatly facilitate the work of excavation if at a later date it becomes necessary to use the rest of the area, and the space so developed will be free from caissons ranging from 4 feet, 6 inches to 11 feet, 9 inches in diameter.

In estimating the probable total cost of building, a common practice is to compute the cubic contents of the structure and to multiply this cubage by a standard rate of so many cents per cubic foot. Experience of many indicates that these figures for costs per cubic foot are of relatively little value. Office buildings vary so widely in standards of construction and of equipment, and costs depend so much on these factors as well as on size and shape of lot, character of subsoil, location, etc., that arbitrary figures of this sort can be used only for the roughest approximations, or for checking purposes. In S. W. Straus & Co.'s investigations of office building plans submitted to them for assistance in financing, they have found it necessary to depart from the old, inaccurate method of "cubing" and revise the owner's estimates of cost either by taking off the actual quantities from the plans and specifications and making detailed estimates or by carefully checking the plans and specifications with plans which have been worked out from long experience as representing standard costs for various classes of buildings and of various sizes. In these comparisons, full allowance is made for all the deviations from the standard type which any specific project is bound to show. Further, due consideration should be given to the influence of local conditions, particularly to the cost and efficiency of labor at the particular time and place. It is a well known fact that the cost of constructing standard buildings in different cities may show a variation as great as from 20 to 30 per cent. Labor conditions are primarily responsible for such variations, though differences in climate, in distance from the sources of particular building materials and in the severity of local building ordinances may also be important. In many cases the promoter of a proposed building will find it advisable to call for bids from outside contractors; instances might be given where outside bids of this sort have beaten the best local bids by as much as 20 per cent.

Office buildings differ so greatly in shape and size, type of construction, exterior treatment, character of finish and of equipment, etc., that it is difficult to compare costs of different buildings without misleading results. However, as a rough guide to assist the prospective builder in determining his probable relative expenditures on the different parts of his building, there has been prepared a table showing the percentages of various contracts to total costs in the case of a number of important buildings of high grade construction and of approximately 20 stories in height. (See Exhibit A.)

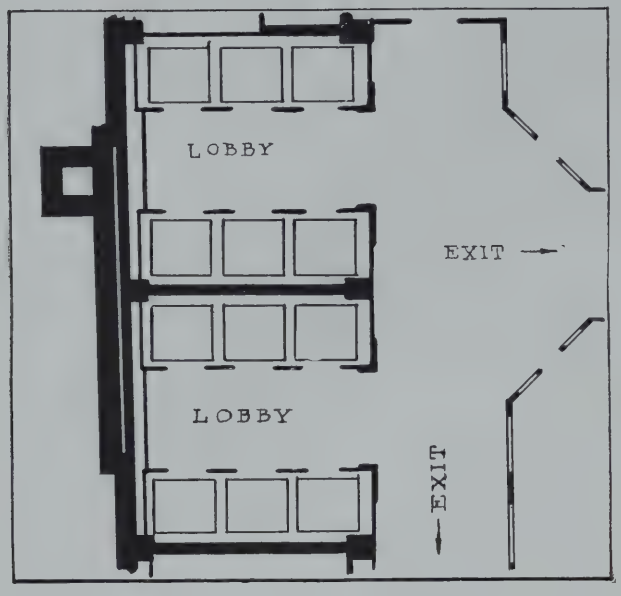
Buildings A and B were built about 20 years ago, but all the others have been erected in the last year or two. Buildings A, E and F house important

EXHIBIT A

Percentages of Contracts to Total Cost of Office Buildings

(Fireproof Construction: 18 Stories or More in Height)

	A 1902 Bank and Office	*B* 1903 Comm'l Office	*C* 1923 Comm'l Office	*D* 1923 Comm'l Office	*E* 1923 Bank and Office	*F* 1923 Bank and Office	*Range*	*Median*
Elevators	5.8	7.7	4.4	5.7	5.1	4.3	4.3- 7.7	5.4
Glass and Glazing	1.4	2.4	1.3	1.9	1.0	1.3	1.0- 2.4	1.3
Hardware	0.6	0.6	0.7	0.9	0.6	0.6	0.6- 0.9	0.6
Heating and Ventilating	4.7	6.5	4.6	4.6	4.9	5.9	4.6- 6.5	4.8
Carpentry	11.8	11.3	(52.3)	15.6	10.3	7.0	..	11.8
Masonry	22.7	26.4		30.3	25.4	25.8	..	25.8
Caissons	..	..	..	7.0	..	4.7	..	..
Brickwork	..	..	..	5.6	..	2.7	..	..
Tile arches and partitions	..	..	..	10.8	..	5.9	..	..
Fireproofing	5.9	7.5	7.7	..	5.9	..	..	..
Cut stone and terra cotta	8.5	7.9	11.0	4.3	5.9	5.3	4.3-11.0	6.9
Marble and Tile	9.2	6.8	6.9	4.5	13.1	9.6	4.6-13.1	8.1
Ornamental Iron	5.9	3.9	4.1	3.2	6.2	3.5	3.2- 6.2	4.0
Painting and Decorating	1.2	0.5	0.8	1.0	0.7	1.0	0.5- 1.2	0.9
Plastering	5.7	4.4	3.1	5.1	3.1	3.0	3.0- 5.7	3.8
Plumbing	4.2	4.8						
Roofing, Sheet Metal and Fireproof Doors and Windows	0.6	0.6	3.6 0.5	4.5 0.8	3.0 1.6	3.3 1.6	3.0- 4.8 0.5- 1.6	3.9 0.7
Steel (including inspection and erection)	13.8	15.6	12.6	14.6	13.3	16.5	12.6-16.5	14.2
Vault and Vault Equipment	5.6	0.8	..	..	3.7	2.2	..	..
Wiring, Lighting Fixtures, etc	4.0	3.9	4.3	2.3	3.6	3.2	2.3- 4.3	3.7
Wrecking, Excavating and Shoring	..	..	..	1.5	0.7	3.0	..	..
General Conditions	..	..	..	1.5	..	5.8	..	..
Miscellaneous	2.8	3.8	0.8	1.9	3.7	2.4	..	2.6
	100.0	100.0	100.0	100.0	100.0	100.0		



An Economical Arrangement of Passenger Elevators in Two Batteries of Six Cars Each

banking institutions, while B, C and D are office buildings in the strict sense. In the sixth column the range of the items for the six buildings is presented, and in the seventh column the median of the items. In some of the classifications, for instance, Hardware, Heating and Ventilating, Plumbing and Steel, the proportion of the contract to the total cost is surprisingly uniform. The percentages for Carpentry and Masonry, however, vary considerably because of important differences in the character of foundations, material used for the exterior walls, and type of finish. All of the substantial differences are subject to explanation. For instance, the high percentage for elevators in Buildings A and B is due to the fact that these two buildings use hydraulic installation. The high excavation costs in Building F, as compared with those of Building D, is to be explained by a greater number of basements. Building D is low on marble and high on carpentry because of the character of the finish. Subject to such differences in character of construction and equipment, in the case of any individual building, this table of percentages can be used as a rough guide in preliminary estimates of expenditure on the various parts of the building.

As a building is a durable commodity, its economic soundness can be determined only by what it returns throughout the whole of its commercial life. Its useful or commercial life may be shortened or ended either by physical decay due to wear and tear and the mere passing of time (physical depreciation) or by social or economic changes which cause it to fail to perform efficiently the service which is needed at the time and place (economic depreciation or obsolescence). Physical depreciation is constant and as inevitable as fate; obsolescence is usually more sporadic and sudden, but it is a risk to which all property is subject in our dynamic American cities. Our experience with the modern skyscraper is still too limited to determine with complete confidence the rapidity with which it will depreciate or become obsolescent. Usually, however, the physical life of such a structure is considered to be from 50 to 100 years, while its economic life is expected to terminate in about 40 years. A recent investigation by the National Association of Building Owners and Managers seems to indicate that the life of a modern office building may be divided into two periods. During the first period, which extends from the erection of the building to about the 28th year, the gross income remains nearly constant, though expenses rise continuously. During this period the building is able to maintain itself as a first class building, housing the best grade of tenants and drawing the best rentals. During the second period, which extends from the 28th year to the end of the building's life, the gross income falls very rapidly, as does also its operating expense. The net income continues to decline and at a slightly faster rate than during the first period. As a result of obsolescence (due to the normal expansion of the business district, the shifting in location of the business district, the erection of new buildings, more modern and complete service of newer buildings, or the damage caused by new adjacent buildings cutting off light and air), the building finds itself losing its better class of tenants. Because of the decline in net income, operating expenses are proportionately reduced by giving a cheaper grade of service. The building thus becomes a second grade building, then a non-producer, and then a loser; eventually it is replaced by a new structure.

Physical depreciation will largely depend upon, and obsolescence will be greatly influenced by, the character of the materials and equipment which are selected for the building and the general standards of construction which are maintained. The decision upon these factors will depend partly on whether the building is intended as a strict investment proposition or whether it is in part designed for monumental or prestige-building purposes. Any building should be designed and constructed to fit the purpose for which it was intended. Therefore, in the monumental building, which by the way should bring an adequate return, of either a tangible or intangible sort, upon the total investment in it, the commercial need for economy of construction will be sacrificed to some extent to the desire for beauty, grandeur, artistic embellishment, distinctiveness and general impressiveness—without which the building will fail to achieve its objective. Materials chosen with these ends in view—stone, for instance, for the exterior walls because of the impression of solidity and permanence which it gives—will in all probability show also the maximum physical and economic life, though the first cost may be high.

In the ordinary investment building, the objective is to secure the maximum return upon the investment over the longest possible period. Economy, therefore, is the ruling motive. Sound economy,

however, relates not only to original cost but to all the costs that have to be incurred throughout the life of the item. In selecting materials, therefore, the problem will be to secure materials of the maximum physical life consistent with the minimum of cost. The answer to this problem will in many cases call for fine discrimination. For instance, there is still some controversy among the experts as to whether terra cotta, which has probably a shorter life than stone, is to be preferred to cut stone now that the difference in original cost is not great. In other cases the decision will not be so difficult to make. Under certain conditions of water supply, the use of brass piping will undoubtedly prove economical in the long run. So, also, in most cases will the choice of copper flashings and gutters, instead of those made of galvanized iron; mahogany or walnut trim instead of the cheaper woods; a slightly better grade of wire than ordinary code wire; and plate glass instead of ordinary glass for all exterior windows. Further, on account of lower maintenance costs as well as because of their effect on insurance rates and the greater amount of light area which they make possible, metal windows are now probably to be preferred to those of wood.

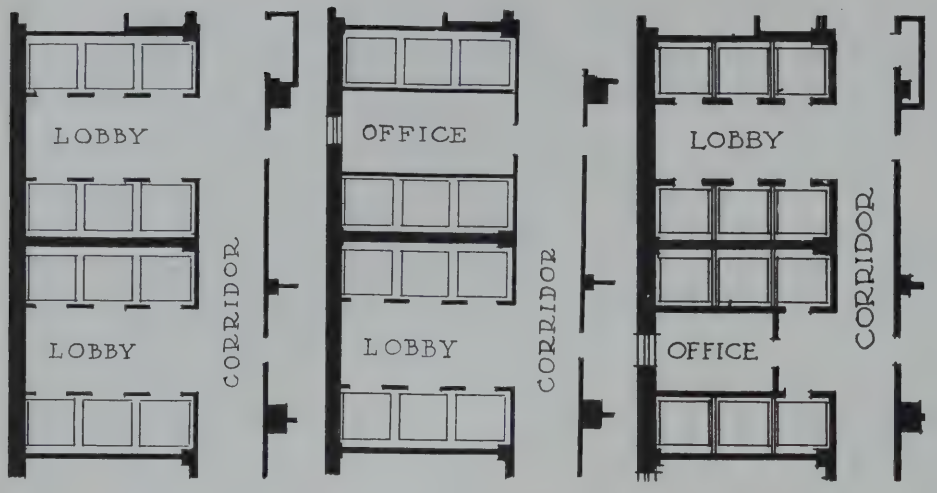
Special consideration should be given to the mechanical equipment, both fixed and motive, which today makes up from 10 to 25 per cent of the total cost of a building. It is the normal thing for this mechanical equipment to be reconstituted at least once, and in the case of some items even twice or three times during the life of the building. (See Depreciation Schedule, Exhibit B.) The economic importance of selecting equipment of the highest quality and of the most up-to-date standards at the time the building is erected is, therefore, obvious, if the

EXHIBIT B

Depreciation Schedule

Group Equipment	*Economic Life*	*Per Cent Annual Depreciation*
A. Buildings		
Class A Construction	50 years	2
" B "	40 "	2½
" C "	33 "	3
Floors, wood	20 "	5
" marble and tile	20 "	5
Plastering	20 "	5
Sheet metal, spouting	15 "	6⅔
Hardware	20 "	5
Roofing, tin	15 "	6⅔
" composition	15 "	6⅔
" shingle	15 "	6⅔
Stacks, brick	33 "	3
" steel	12 "	8⅓
Doors	33 "	3
Windows (complete)	33 "	3
Interior wood trim	40 "	2½
B. Building Appurtenances		
Standpipes, Flag poles, Fire-escapes, Deep wells, Sewers, Sidewalks	15 "	6⅔
Paving	25 "	4
Retaining walls	20-50 "	2-5
Tanks, steel	22 "	4½
" wood	12 "	8
C. Mechanical Equipment		
Heating and ventilating, Sprinklers, Inside electric wiring, Elevators, Fire-alarm apparatus, Fire-prevention apparatus, Air-compressors, Shafting, pulleys, Hangers, belting	20 "	5
Plumbing	17 "	6
Elec. light and power wiring	17 "	6
Refrigeration mach.	15 "	6⅔
Laundry machinery	15 "	6⅔
Lighting fixtures	15 "	6⅔
D. Power and Steam Plant Equipment		
Boilers, Water purifying plant, Engines, Steam turbines, Superheaters, Stokers—moving parts, Dynamos, Electric machinery—generators, Electric machinery—motors, Switch parts, Cable, underground	20 years	5
Elect. wiring-power mchy.	17 "	6
Steam plant equip	17 "	6
Piping	13 "	7½
Stokers—fixed parts	5 "	20
Storage batteries	17 "	6
Engines—gas and oil	13 "	7½
Fuel oil system	13 "	7½
Gas plant equipment	15 "	6⅔
Hydraulic plant equip	17 "	6
Pumps	13 "	7½
E. Furniture and Fixtures		
Partitions, wood	13 "	7½
Mechanical office equip.	5 "	20
Telephone equipment	13 "	7½
Carpets, rugs, linoleum	5 "	20
F. Miscellaneous		
Small hand tools	10 "	10
Wood working mchy	20 "	5
Vacuum cleaners—portable, Vacuum cleaners—stationary	10 "	10
Vacuum cleaners—hand, Scrubbing machines, Meters	20 "	5

(From report of Cleveland Association of Building Owners and Managers on Depreciation, Obsolescence and Appreciation.)



Express and Local Elevators Arranged in the Same Batteries. Floor Area Between Express Elevators Used for Office Purposes. Straus Building, Chicago

necessity for replacement is to be postponed as long as possible and if the costs of maintenance are to be kept at a minimum. The elevator installation in the new Straus Building may be used as an illustration of the utmost pains being taken to attain these objects. The cars are of super-speed type, their acceleration and deceleration being automatically controlled to insure a smooth and easy start and stop. The cars are brought to a perfect level with the floor by another automatic control. The doors, which are of pleasing design, are operated by air, opening automatically when the car comes to rest at a floor and closing by button control of the operator. In safe and efficient operation as well as in appearance, they represent the most modern standards. Their selection was governed by the desire to give service of maximum efficiency at reasonable cost over the longest possible period.

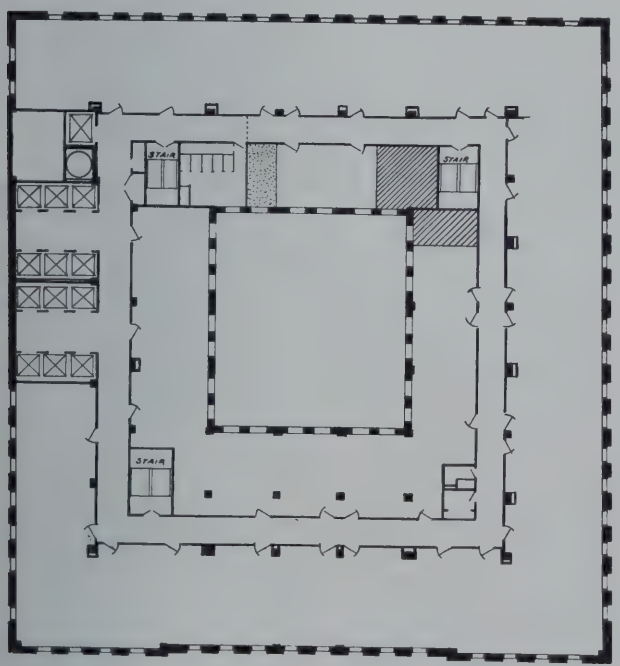
The importance of postponing obsolescence and reducing maintenance charges by the careful selection of materials and equipment cannot be exaggerated. But the risk of obsolescence can also be reduced and the economic value of the investment immensely increased by giving due attention to the income and management viewpoints in the planning and layout of the building. For years S. W. Straus & Co. has maintained a plan service department, manned by architects, engineers and practical loan experts, whose duty it has been to revise building plans submitted to them with the aim of reducing costs of construction, eliminating waste space, adapting layout to serve most effectively the needs of prospective tenants, and in these and other ways increasing the rate of return upon the investment. Early in 1923 a similar service was initiated by the National Association of Building Owners and Managers, the new Straus Building being the first building to receive the benefits of this service. The Building Planning Service of the Association, in bringing to the planning of new buildings the suggestions that flow out of the ripe experience of the best building managers in all parts of this country, carries rich promise for the future of office buildings from the point of view of efficient service to the tenant and adequate return upon the owner's investment.

Only the briefest reference can here be made to some aspects of planning work of this type. One of the most obvious services that can be performed is the reduction of cubic space and length of exterior wall to the minimum. As the major part of the cost of a project is in the enclosing wall, the importance of such reductions is obvious. By changing the shape, size, and position of the light courts, or by shifting service facilities, using minimum story heights and floor thicknesses, eliminating unnecessary thickness of enclosing walls, revising layout of rooms, and altering the general shape of the proposed building, instances might be cited of savings in construction costs of from 8 to 15 per cent without sacrifice of income-producing area. In determining the proper plot solution, the endeavor should be made to get the ratios of square feet of net rentable area to cubic contents and to square feet of enclosing wall as high as possible. In some buildings a ratio as high as 1 to 18 or 19 has been secured. In others a much smaller ratio of rentable areas has been had because clear ceiling heights have exceeded a satisfactory minimum of, say 10 feet or 10 feet, 6 inches, or because walls have been unnecessarily thick or the shape of the building unnecessarily wasteful.

Endless experiment will be necessary to produce the maximum of first class net rentable area at least cost. A large amount of space—from 30 to 40 per cent—will necessarily be required for light and ventilation courts as well as for the physical structure itself and for essential service facilities. If too much of the lot area is covered by the building, light and air are sacrificed, cubic contents increased, and additional cost incurred for relatively unproductive space. If too small a portion of the lot is covered, a return upon the full value of the land is not secured. If elevators, stairways, and other public facilities are unwisely located or if too much space is wasted in public corridors or for other unproductive purposes, similar results follow. In the new Straus Building important economies were effected by utilizing a dark area behind the heavy steel girders on the fifth floor, Michigan Avenue frontage, instead of the basement, for safety deposit box installation, and by so finishing the express

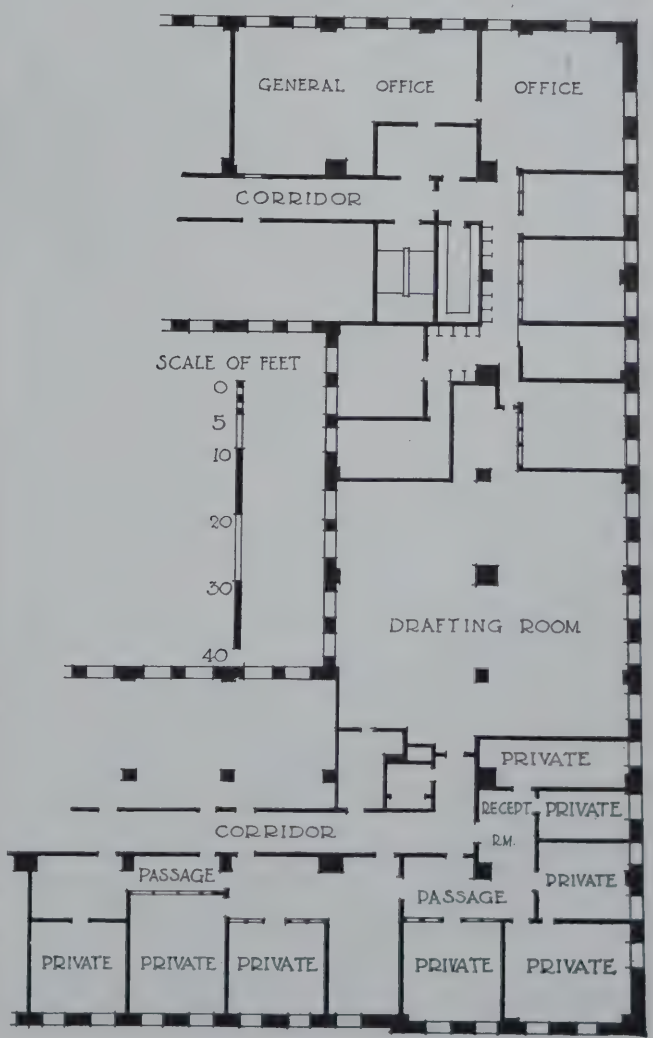
elevator lobbies from the second to the 13th floors, and the local elevator lobbies above the 17th floor, as shown in the diagrams herewith, that they could be used for rentable purposes. Dark court space was utilized for toilets, slop sinks, building utilities and stairs. In the development of a plan, however, the mistake should not be made of attempting to get the maximum of net rentable area without due regard to the quality of the space. Depth and exposure of offices, amount of dark or poorly ventilated space, etc., should be considered in working out an average square foot rental for the rentable area secured under each proposed scheme of plan. It is not necessarily the plan which utilizes the largest proportion of the lot that will give the largest return upon the investment.

Perhaps as important as any other single item is the layout of typical office floors. If the maximum flexibility of plan and the best arrangement for subdividing space into floors are to be obtained, provision must be made at the start for the proper spacing of columns. The best size of office will depend in part on the character of the tenants to whom the appeal is being made, in part on the latitude of the city, and in part on the effect of climate, sun, air, light, width of street, open spaces, water, or other natural conditions affecting light. Lawyers with small libraries and purchasing agents or advertising men whose filing needs are important will require more space than the tenant who simply requires room for desk and chairs, while the need for adequate and well distributed natural light, the best rental feature which any building could possibly have, will normally condemn the office with a depth of much more than 35 feet. Under normal conditions, spaces between columns should approximate 17 to 18 feet. This makes possible perhaps the most generally serviceable type of office unit, 17 to 18 feet in width and 25 to 30 feet in depth. Such units can be subdivided by a T-partition into two private offices of about 8 by 16 and a reception room of the same size running at right angles, and can be thrown into larger area when desired. Numerous studies, however, should be made to determine just what are the best depth and width under all the given conditions and just what arrangement will produce the maximum of perfectly and permanently lighted space with the minimum of building area of the typical floor. Window heads should be as near the ceiling as possible in order to assure the maximum amount of light, while window sills are well placed at 2 feet, 6 inches from the floor, a convenient height.

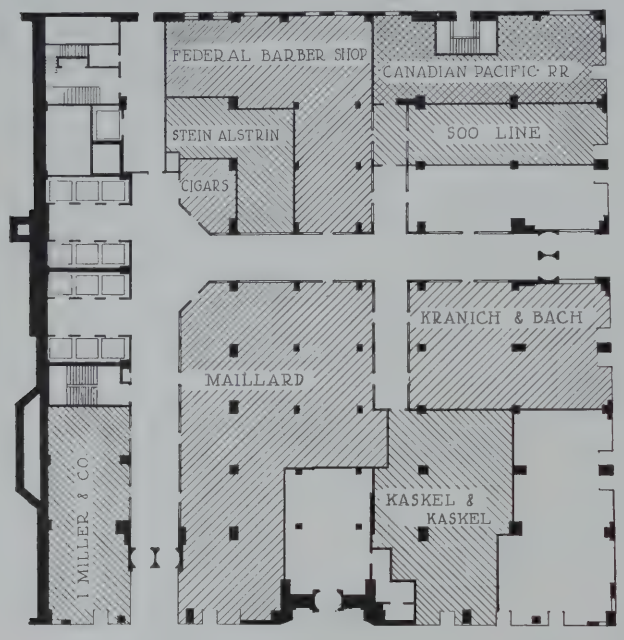


IN the diagram above the shaded areas show the spaces originally planned as toilets on a typical floor of the Straus Building, Chicago. Toilets as actually built are shown at upper left-hand corner of the interior court. Dotted portion next the actual location indicates floor area saved, and also shows that only one window is used. This arrangement makes it possible to construct a partition across the corridor as indicated by the dotted line and to include all or any portion of the corridor in rentable area without affecting the accessibility of toilet locations.

Diagram at right shows part of one floor of the Straus Building arranged for occupancy of two tenants; it indicates the extreme flexibility of the plan, since offices requiring one space unit or an entire floor can be taken care of without making unduly expensive alterations.



Too much emphasis cannot be placed upon the necessity for elasticity in all the arrangements made for the subdivision of office space. With the ever-changing tenancy of modern office buildings, flexibility is of the utmost importance if heavy alteration costs and rapid obsolescence are to be avoided. Interior columns, for instance, should be spaced, wherever possible, near the corridor lines so that subdivision into areas larger than the unit spaces is possible. Light outlets should be placed on the outer columns instead of on partitions in order to save expense when partitions are moved. Plumbing and heating facilities should also be so arranged as to



Ground Floor Plan, Straus Building, Chicago
Graham, Anderson, Probst & White, Architects
Entrances from Both Streets Give Direct Access to Elevators, Show Windows Forming the Walls of the Corridors

secure the maximum economy in making future alterations of space. Corridors should be so arranged that dead ends may be closed up and thrown into open spaces for large suites. A certain number of typical undivided floors should be specified in letting the original contracts and a definite price per unit provided for additional partitions, doors, wiring outlets, plumbing, etc. Otherwise the bills for shifting partitions and other alterations for tenants may prove excessive. The size and arrangement of windows also should be considered from the point of view of adaptability of space to the varying needs of successive tenants. Windows should be so arranged as to permit the greatest flexibility in the subdivision of space through the shifting of partitions. For the same reason corridor doors should be placed opposite windows and never opposite the stonework dividing windows, and they should open away from the direction of approach from the elevators. Illustrations of typical floor plans in the new Straus Building are presented, showing maximum office depths of 27 feet (with few more than 26 feet) and indicating the possibilities of flexible treatment by means of the actual layout of a large office. A study of the floor plan itself will indicate the possibility of accommodating tenants requiring areas ranging anywhere from a single unit to an entire floor. This has been made possible by the care exercised in locating toilets, stairways and other building utilities. Obviously, the use of a complete floor as a single unit would have been impossible if men's and women's toilets had been located on each floor, properly separated on court space, instead of alternating them with men's on two successive floors and women's on the next. This plan is practical and economical.

As has been already found out, the ground floor should be the greatest revenue producer in the whole building. If this be true, the utmost care in its arrangement and fittings will amply repay the owner. The precise types of tenants who should do best in the particular location have already been determined by the original economic survey. Every endeavor should, therefore, be made to get the leaders in each of these types. But if these desirable tenants are to be attracted, the ground floor stores should be so constructed as to appeal to their particular requirements. A special study should be made to determine the proper widths, depths and ceiling heights for such occupancy, the location of entrances, the adequacy of freight receiving rooms, the requirements for mezzanine floors and for storage space in the basement. Too often these fundamental questions are decided arbitrarily. If at all possible, column spacing should be adapted not only to the upper floor offices, but to the ground floor stores as well. In this connection it is well to remember that if specialty shops are secured as tenants, a store width of only 15 to 17 feet may be required. This will not only solve the problem of column spacing for the whole building but will probably make possible one or two extra stores on the ground floor, each paying probably as much rental as stores with wider fronts would have paid. Depth is also important. Some types, such as novelty stores, etc., require only a very shallow store, while for shops of the general merchandising type a much greater depth is usually necessary. Another vital point is the shop windows, for, assuming the location, the real value of a store to a tenant lies in the tenant's ability to display his merchandise. In too many of our older buildings heavy monumental columns and other architectural embellishments divided the store fronts and destroyed most of the display space and consequently the rental value of the stores. Today the attempt is made, insofar as sound engineering standards make it possible, to eliminate everything that breaks the store front's glass line. Needless to say, uniformity and dignity should govern the general exterior treatment of store fronts under office buildings.

Where the office building is being built by a

bank or is to have an important bank as one of its tenants, the modern tendency is to put the bank on the second floor, because of the desire to conserve the first floor space for high class shops, and also because of the deleterious effect of a bank on the value of adjoining sites used for shopping purposes. Where the second floor is not preëmpted for banking rooms, consideration should be given to the utilization of the street frontage at least for upstairs shops. Such space is in demand for an increasing number of kinds of business. If sufficient demand exists for this type of space, the second floor may be made to pay higher returns than if utilized for ordinary office purposes. In such case, attention must be given to the column and window arrangements to provide adequate display space.

In the provision made for the main entrance, public corridors, elevator lobbies, and other public space, the endeavor should be not only to satisfy every demand of convenience but also to give the effect of beauty, dignity, and spaciousness without undue waste of valuable space and without undue expenditure on artistic embellishment. These conflicting motives should be reconciled in a manner in harmony with the general character of the particular building. In the strictly commercial building, however, whatever of income is sacrificed to impressiveness and beauty in the provision for public space should be considered to be made up elsewhere; for instance, by better occupancy or by a slightly higher rental schedule because of the greater distinctiveness of the building.

In this discussion of the problems which confront the business man who is contemplating the erection of a modern office building, the writer has endeavored to apply to the solution of these problems the economic touchstone. He has recommended that principles and practices be followed which will lead to (1) the most economical but not necessarily the least investment in land; (2) the reduction of the cost of constructing the improvement to a minimum consistent with the highest utilization of the site and with minimum operating and maintenance costs; and (3) the production of the maximum rentable area consistent with desirable quality of the space and with the requisite efficiency of service facilities. The thorough carrying out of such a program will undoubtedly bring to the owner the maximum return upon his investment during the entire life of the property. But the application of these principles in the planning of his building and the analysis of actual operating results, once his building has been erected, will be greatly facilitated by the use of a simple yardstick for the comparison of costs and returns. The owner must regard himself as a producer or manufacturer of office facilities and use ordinary cost accounting methods as an essential tool for the control of his business. Cost accounting requires a basic unit in terms of which costs and returns can be stated in order to facilitate accurate record, intelligent analysis and effective planning for the future.

In the office building field, the square foot of rentable area is gradually becoming established as the most logical single unit. It is increasingly used as the standard unit even in the sale of office space. When one remembers that some competitive offices are 15 by 40 in size and others 18 by 25, the absurdity of comparing office rentals on the "per office" or "per room" basis is apparent. Yet, for renting purposes, not even the square foot can be standardized. So variable is the attractiveness of office space that the renting appeal to the tenant should probably be made on no single basis. On the other hand, the square foot unit provides a reasonably satisfactory basis for calculating the average rental of his available space, as well as for comparing it with the various items of his operating cost and with the returns and costs of other similar buildings. Other units have been advocated, but why the square foot of rentable area is usually regarded as the most satisfactory cannot be considered here.

If the office building owner is to be a manufacturer of office facilities, it is essential for him to know what his cost of production and his return upon his investment are likely to be. As has been already found, he selects from the various plan

OPERATION COSTS OF SEVEN EFFICIENT CHICAGO OFFICE BUILDINGS—1922
(In Cents Per Square Foot of Rentable Area)

		A	B	C	D	E	F	G	Median	Arithmetic Average
A	1 Cleaning	31.7	28.4	28.5	36.2	27.7	28.0	37.1	28.5	31.1
	2 Elec. system (incl. power)	1.3	1.7	1.2	.9	1.1	1.0	6.6	1.2	2.0
	3 Heating and ventilating	20.3	9.9	7.6	11.1	4.1	14.0	15.3	11.1	11.8
	4 Plumbing system (incl. power)	1.4	2.9	2.0	.9	.3	2.0	1.4	1.4	1.6
	5 Elevators (incl. power)	12.9	14.2	13.0	11.2	9.9	23.0	17.1	13.0	14.5
	6 Gen'l exp. (incl. power)	6.7	14.8	3.2	10.2	7.9	16.0	15.7	10.2	10.6
	7 Power	0.0	0.0	0.0	1.1	0.0	0.0	0.0	0.0	.2
	Total Operation Cost	74.3	71.9	55.5	71.6	51.0	84.0	93.2	71.9	71.6
B	1 Alterations	4.9	2.3	0.0	4.8	.7	5.5	3.9	3.9	3.2
	2 Building repairs	1.1	2.0	8.6	3.0	3.5	5.5	1.5	3.0	3.6
	3 Decorating	0.0	4.9	2.1	5.4	3.5	3.5	4.4	3.5	3.4
	Total Construction Cost	6.0	9.2	10.7	13.3	7.8	14.5	9.8	9.8	10.2
C	1 Insurance	1.9	2.1	2.7	3.3	2.0	1.0	3.1	2.1	2.3
	2 Property taxes	43.8	49.4	36.9	63.3	28.4	51.0	50.8	49.4	46.2
	3 Depreciation	18.3	15.7	21.1	11.9	13.2	8.0	23.1	15.7	15.9
	Total Fixed Charges	64.0	67.2	60.7	78.5	43.6	60.0	77.0	64.0	64.4
D	1 Ground rent	11.5	30.0	0.0	12.2	0.0	20.0	..	..	..
	2 Bond interest	17.1	17.2	0.0	..	30.3	..	..	..	..
	3 Interest on notes	0.0	0.0	30.8	..	18.8	..	..	..	..
	4 Income and capital stock tax, etc.	8.6	2.7	.3	..	7.2	..	..	..	..
	5 Net income	46.7	73.6	67.7	..	22.3	96.0	181.0	70.7	81.3
	Total "D" Accounts	84.0	123.5	98.9		78.7	116.0	181.0	107.5	113.7

schemes submitted to him that which promises to yield him the greatest return upon the funds which he will have to invest. Hence, the number of square feet of rentable area which each plan scheme will produce is calculated, and this is divided into the total estimated cost of the building and the land. The resultant figure of investment per square foot of rentable area will under present conditions vary as much as from $15 to $40. The next step is to take the *average* square foot rental, which it has been estimated can be secured from all the rentable area (due allowance in this estimate having been made for undesirable space), and figure it as a percentage of the investment per square foot of rentable area. This computation will give a gross rate of return upon the investment which is probably sufficiently accurate as an indicator of the relative efficiencies of the various plan schemes submitted by the architect. Upon the basis of this test, the final choice of plan to be developed can be made.

But the soundness of the investment can be determined only by the determination of the *net* return upon the investment. For that purpose operating and other costs must be estimated and reduced to a basis of so much per square foot of rentable area. In the Experience Exchange of the National Association of Building Owners and Managers,* which has been published since 1920, is to be found an extraordinarily valuable compilation of data upon this subject. Actual operating figures for over 150 buildings in all our leading cities are presented and subjected to several different types of analysis and comparison. As an *average* of the figures for a number of buildings of different degrees of efficiency in construction, layout, equipment and management and located in all parts of the country may mean very little, it has been attempted here to arrive at a better norm or standard by taking the figures for only a few buildings which are known to be comparable in size, height and general character and which are well located, efficiently constructed and equipped, and managed according to the best modern standards. All seven buildings are also located in Chicago. The data for these buildings for 1922 are presented on page 131. The arithmetic averages and the medians for each classification of expense are given in the last two columns. A study of this table with due consideration given to a few special features which explain important deviations from the mean or median will indicate that the owner of a proposed office building which will offer to tenants the highest grade of building facilities and of building service should in his calculations of net income allow about 72 cents per rentable square foot for the cost of the ordinary services and an additional 9 or 10 cents per square foot for alterations, repairs and decorating. The table calls for 64 cents for insurance, taxes and depreciation, but these items can probably be figured more accurately by a specific estimate in each individual case based on knowledge of local conditions in regard to tax valuation, tax rates, insurance costs, etc. The accounts in Group D will depend so largely on the particular type of financing adopted, and the possibilities are so varied that it would be impossible to discuss them here. It is only necessary to say that the average rental per square foot minus the total of the accounts in Groups A, B and C will, if figured as a percentage of the investment per rentable square foot, give the rate of net return.

One important qualification to these calculations needs to be made. They have made no allowance for vacancies. As no building can hope to run 100 per cent full year in and year out throughout its entire life, it is imperative that such an allowance be made. Its amount will depend on experience and conditions in the individual locality. A study of vacancies in Chicago office buildings over a 10-year period showed an average vacancy of only 6 per cent, but investment bankers normally allow 10 per cent in their estimates of probable earnings. Not only should earnings be figured in this way on a 90 per cent occupancy, but sound accounting would require the setting up of a vacancy reserve built up by rents above 90 per cent in good years and designed to maintain the income of the building in the depression years. Such a policy would tend to prevent that deterioration in service, physical condition of building, character of tenants and renting policy which is too apt to occur in years of excessive vacancies. Having determined the investment per square foot and the probable operating costs per square foot, it will be possible to compute the average square foot—gross and net—rentals which the owner will be required to get with, say, occupancies of 100 per cent, 90 per cent, 80 per cent, etc., in order to give him a net return of 7 per cent, 8 per cent, or 10 per cent.

In brief summary, sound economics requires that the decision to build an office building be based upon an ascertained public demand over a reasonable period of years for the facilities to be provided; that the site be wisely selected; that the structure to be erected represent the logical improvement of the site; that it be built at a cost in keeping with the service which it is designed to render; that it be equipped in such a way as to insure the lowest possible maintenance and operating cost during its entire life; and that it be so planned and so managed as to secure the maximum of net income over the longest possible period. These are the tests which a financial house would apply before making a loan upon the project. The banker will also need to be assured of the moral and financial responsibility of the borrower, and that the net income will be sufficient to equal from two to two and one-half times the greatest annual interest charge. If these tests are successfully met by an office building enterprise in one of our larger cities, the net income should run 7 per cent or more and should net the owner a reasonable return upon his equity.

*See Bibliography, page 159.

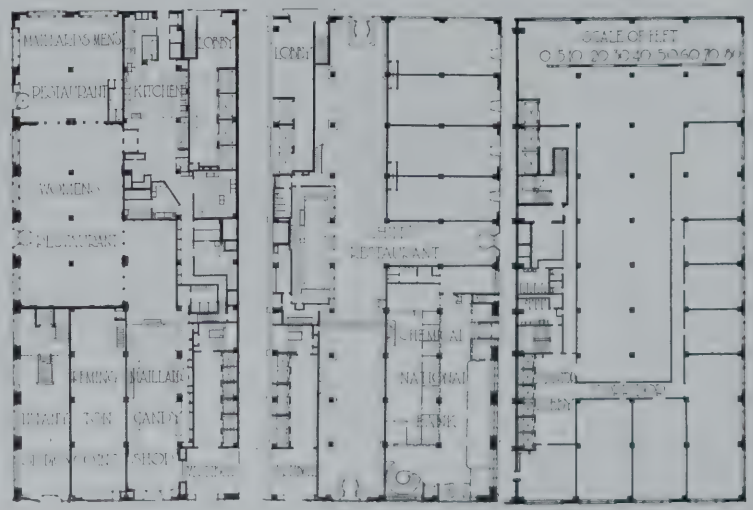
The Knapp Buildings, New York

CROSS & CROSS, Architects

General View of the Joined Buildings

IN the Knapp Buildings, the original plan was to occupy only the northern half of the block, but demand for floor space was so great that before construction work was started, it was decided to duplicate the building on the southern half of the block, thus making twin buildings. A single foyer connects the entrances and the elevator halls of both buildings. In method of construction as well as in plan the buildings are identical. Limestone is used for the three main facades, with terra cotta trimmings at the top, and face brick for the rear. Construction is steel frame, with cinder concrete arches and terra cotta backup tile in curtain walls. Heating is by forced circulation hot water. Electric service, 120-240 d.c. Elevators, 1-1 traction. Corridors built with building have plaster walls and marble or terrazzo floors; those laid out later have plaster walls and rubber tile floors in blocks of several contrasting colors.

Double Entrance to the Buildings



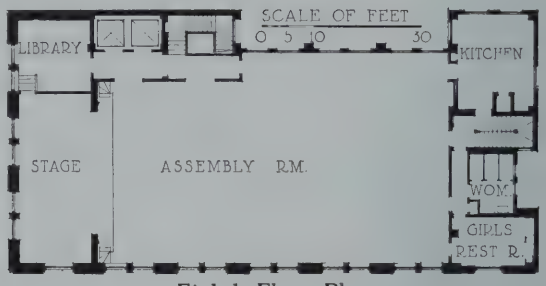
Combined Ground Floor Plan

Half Typical Plan

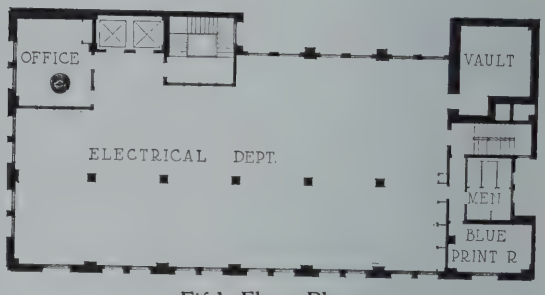
The Pacific Gas & Electric Building, Oakland, California

CHARLES WILLIAM DICKEY, Architect

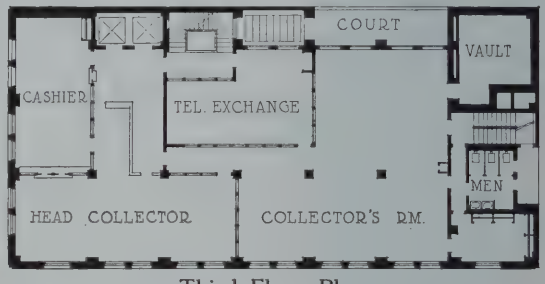
General View of the Building



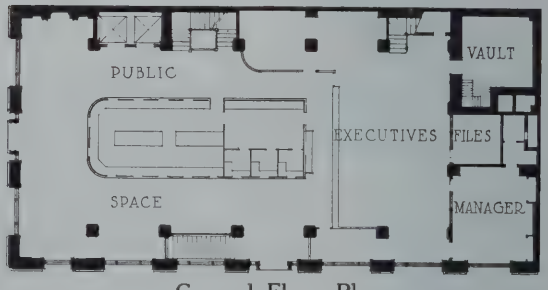
Eighth Floor Plan



Fifth Floor Plan



Third Floor Plan



Ground Floor Plan

THE Pacific Gas & Electric Building is a strictly fireproof structure with walls of red brick and terra cotta. It is eight stories high and is occupied entirely by this company. On the ground floor is located the main office, with marble floor and wainscoting, imitation Caen stone walls, and mahogany counters. In the center is located a working space surrounded by counters where orders for service may be placed and bills paid. In the rear are the desks of the executive officials and their clerks and the manager's office, as well as a large vault connected by a stairway with a similar vault in the basement. From this main office two marble stairways and two elevators lead to the basement, the front portion of which is given up to a display room for gas and electrical appliances. The rear portion of this floor is given up to service rooms. There are two high-speed electric passenger elevators, and stairways to the top of the building. On the upper floors are located successively the bookkeeping, collection, accounting, electrical, gas and dispatchers' departments. These departments are connected with the main office on the first floor by means of a pneumatic tube system and intercommunicating telephones. Each department has a fireproof vault.

On the eighth floor there are a lunch room with a kitchen served by an electric dumbwaiter from the basement, and a library and a large assembly hall.

The Architect and the Building Manager

By WILLIAM MARSHALL ELLIS
President, National Association of Building Owners and Managers

EDITOR'S NOTE—The National Association of Building Owners and Managers has recently developed an Advisory Service to assist architects and owners in the planning of large investment buildings. This movement to make available advisory service based on practical operating experience offers an interesting opportunity for increasing the economic and physical efficiency of such buildings. Accordingly this explanation is presented for the benefit of architects facing problems of planning.

IN designing and building an office structure, the architect desires to accomplish two important results: 1. To provide a building that will adequately and efficiently house office tenants; 2. To provide a building that can be rented at good prices and operated economically so as to earn a reasonable return on the investment in land and building.

Naturally, the architect does not have experience in operating the building which he plans. As soon as the structure is finished, it is turned over to a building manager who must find tenants to rent the building and who is expected to earn for the owners a profit on its operation. The manager very quickly finds its strong and weak points from both the standpoint of the tenants and that of operating efficiency. In designing new models or improvements in automobiles, the manufacturers make great use of the experience and knowledge obtained through their service stations. Service stations soon know how the automobile is "standing up" in actual use. In the office building field the architect should consider the advisory service of the building manager and should make the utmost use of his experience.

The requirements of tenants in office buildings are continually changing. A few years ago the average amount of space used per occupant was 125 square feet. Today, in many cases, this has been brought down to 75 square feet per person. This change is due to the increase in cost of space and also because tenants are planning their offices more efficiently. As a city grows in size, changes occur in the kinds of space which the tenants in that city can use. In the medium sized city, where the average tenant uses less than 1000 square feet, offices more than 25 feet deep are a mistake, as they can be used only by the few large tenants. In Chicago or New York, however, space 30 or 35 feet in depth finds a good market because it can be efficiently used by the large clerical departments of the great companies. Some years ago office space was lighted by the cheapest fixtures that could be purchased. Today efficient lighting is a distinct selling point, made use of by the building manager. He realizes that if his space is so well lighted that the employes of his tenant can do more work in his building than elsewhere, he has a distinct advantage over the other buildings.

The same is true of the operating equipment of an office building. Continual improvements are being made in mechanical devices and in methods of operation. Labor is one of the chief elements of cost in building operation, and the quantity of it used varies from 2½ hours per square foot per year to as little as one-quarter of an hour per square foot per year. This variation is due both to difference in type of service rendered and to difference in service layout and equipment of the buildings. The architect fixes, to a large degree, the future operating costs by the layout he gives the manager with which to carry on his work.

It is not the purpose to enumerate here the specific ways in which the building manager can be of assistance to the architect in planning and equipping an office building. It is simply desired to point out that the manager is the principal source from which the architect who desires to embody in his building the most practical ideas may obtain his information. He should urge the owners to employ a competent building manager as soon as they decide to erect a building, so that his knowledge may be utilized in the planning of the structure.

The building manager realizes this fact very keenly, perhaps because it has been his problem to rent poorly designed space and to endeavor to correct the bad operating layouts handed him. This statement does not mean that all office buildings are badly designed. It is a pleasure to recognize the ever increasing practical ability of the firms building office structures. On the other hand, however, there are probably few buildings that do not have some points which might have been improved if the knowledge gained from experience had been used The practical problem of getting the utmost efficiency out of a building and at the same time keeping down the investment cost per square foot of rentable area has become much more serious as a result of the very large increases in construction and operating costs following the war. To help meet this necessity for better planned buildings, the National Association of Building Owners and Managers has developed a Building Planning Service which is at the disposal of owners and architects. By means of this Service, it is possible to get together the most experienced operating men in the country as committees to consult with architects and owners on the plans of new buildings. The influence and membership of the National Association of Building Owners and Managers are such that it can command the service of men who probably would not take individual assignments of this sort except at very large fees. This Service has already been effectively employed on a number of recent large buildings to the satisfaction of architects and owners.

The general plan by which the Building Planning Service functions is thus described: For each building a different committee is selected, composed of

those building owners and managers best qualified by experience to analyze the plans of the particular building under consideration. If, for instance, the structure is a bank building, there would naturally be upon the committee one or more managers who have had experience with bank buildings; if a shop building, entirely different managers, having retail shop experience, would be chosen. In this way the Service gives to the owner and his architect exactly the experience necessary to develop his individual building.

A brief outline of the work done by the Building Planning Service on the several structures so far served will illustrate how the committee works and the results which it accomplishes. In all cases, plans and detailed information not only as to the building but as to the character of its location, the desired type of tenancy, etc., are obtained and forwarded to the men who are to serve on the committee at least one week prior to the meeting. This affords the members opportunity not only of becoming familiar with the problem before them, but also of studying it themselves and of having it considered by their office organizations as well. A meeting of the entire committee is then held in the city where the building is to be erected, thus giving the committee an opportunity of studying the problem on the ground.

In analyzing any building problem, the first step is to consider carefully the character of the immediate locality of the structure and its relation to the rest of the business district for the purpose of determining how to make the most advantageous use of the land, not only for the present but also during the entire life of the building. The next step is to determine the character of tenants available at present and desirable in the future. With these points determined the committee turns its attention to a comparative study of the several alternative floor plans evolved by the architects. In comparing these plans, it is necessary to give due weight to several different factors. First of all are determined the amount of rentable area which each plan will produce and the investment per square foot of rentable area for land and building. It is also determined what percentage of the lot each plan utilizes. Next is computed the average square foot rental that will be obtained over an entire typical office floor. Such an average rental takes into consideration the influence of depths of offices, their exposure, the amount of dark space, etc., and a comparison of the figures thus obtained for each plan indicates very clearly the quality of space which each plan gives. Having already determined the investment in each square foot of space and knowing the average square foot rental that may be expected, the percentage of return on the investment is easily computed. This figure is the real test as to the rental efficiency of any plan. It is not necessarily the plan which utilizes the most of the lot that produces the best return on the investment.

Having determined in a general way the best plan development of the lot, the committee then takes up a detailed consideration of the typical office floor plans and the main floor and basement plans. In the consideration of these plans, detailed study is made of the office layouts, the mechanical equipment of the building, the service equipment for the offices, etc. The object of the committee is to develop space of the greatest possible rentability, in which the tenant can be given the utmost service and which can be operated at a minimum of cost. One item in the cost of operation often overlooked is that of changes and alterations in partitions to suit different tenants. If proper consideration is given to the location of lighting outlets, plumbing fixtures, the type of partition used, etc., large economies in future alterations in the building will be possible. In the consideration of strictly engineering and mechanical problems, the committee necessarily limits itself to the application of the experience derived through actual operation, pointing out certain results that must be obtained from the equipment, and sometimes cautioning against the failure of certain arrangements to accomplish the results desired. It does not, for instance, recommend any make of elevators, but does go into the building's problem of elevator service and points out to the owner and architect the kind of elevator service which should be provided. If the building is to cater to any special class of tenants, such as physicians, the necessary equipment for them must be provided. The final work of the committee is to give the owner and his architect all the help possible in formulating the building's renting policies and in preparing for the sales campaign to fill the building.

Such, in general, is the work of one of the Building Planning Committees. The committees are usually in session two days, morning, afternoon and evening. The stenographic report of their meetings generally covers 500 to 600 typewritten pages. As the committees consist of from five to ten men, depending upon the size of the building, this Service secures in the short space of 20 hours the benefits of at least 100 years of building management experience.

The benefits of the Building Planning Service to a new building may thus be summarized:

1. It increases the rentable area of the building with a consequent reduction in the investment per square foot on which a return must be earned.

2. It reduces the construction costs, which also reduces the investment per square foot.

3. It increases the rentability and quality of the space obtained.

4. It also increases the efficiency of the services and utilities of the building.

5. It decreases the operating costs of the structure.

6. And lastly, but most important, it increases the economic stability and profitable life of the building through planning the structure not only to fit the district in which it is, but also to build up the district to be an efficient home for a definite tenancy.

Financing the Office Building

By C. STANLEY TAYLOR

THE problem of financing the office building must be considered in four stages before actual construction can be started or working drawings and specifications completed. These stages include drawing up the prospectus of the proposed project; mortgage financing; equity financing, and finally the determination of income and maintenance figures and other items of direct interest to the prospective investor. The general method of financing the office building project is usually predetermined by the motive for such investment, which may be purely of a speculative or investment nature, for the purpose of housing a large business organization, or directly promoted as a coöperative venture for the benefit of several tenant-owners.

The architect's business relations in the early stages of an office building project usually take one of two forms. If the building is being planned primarily for single occupancy or represents a direct investment by an estate or with private funds, the architect will be retained in the usual way to carry out the project, and he will normally be paid in accordance with the advancing stages of his work and under a schedule similar to that recommended by the American Institute of Architects. If, however, the project is of the type developed by promoters, either for speculative purposes or as a cooperative venture, the architect will more probably be called upon to risk a certain amount of his time in the preparation of sketches, plans and cost figures.

No definite recommendation can be made as to the feasibility of the architect's sharing in the risk of such an enterprise during the stage of the promotion, since a project of this nature presents itself for individual analysis. There are several practical considerations which will aid the architect in determining whether he wishes to risk some time and expense in order to develop a possible commission for his office. The points suggested here should be given serious consideration in arriving at such a determination. The promoter's past record should be studied as well as the logical need and the probable success of the proposed building, both as to type and location. The architect should be certain that the promoter has either an option, contract or title which gives him control of the site which has been selected. It is also quite necessary that the architect be taken fully into the confidence of the promoters and kept informed of progress in both mortgage and equity financing negotiations. In this relationship the architect can provide a definite and valuable contribution to the ultimate success of the project. Before any successful prospectus can be drawn up to cover such a proposed office building operation it is quite necessary to have well presented sketch plans, outline specifications and closely approximated cost figures.

Plans used in the prospectus should include carefully developed floor plans and elevations with a rendered drawing (preferably in color) to indicate the actual finished appearance of the building. Through consultation with dependable building contractors it will be possible to arrive at a preliminary cost figure which should be carefully checked against costs of similar operations in the locality in order that it be not far from the figures represented by final bids.

It is suggested that as soon as preliminary plans have been drawn an experienced real estate management organization or an individual well versed in operating and managing office buildings should be brought into consultation for the purpose of drawing up a schedule of rentals and operating and maintenance costs, as described in detail in another article in this issue. It is highly important to the architect that such real estate management consultation be employed in the early stages of the project, as it will be found that this expert opinion will materially affect the plans for the building. On such advice, together with careful observation by the architect, rests the final decision as to the planning of the ground floor, and whether it should include store rentals; logical sizes of offices; provision which should be made for various special occupancies in other parts of the building as determined by local conditions and needs and practical types of equipment.

First Mortgage Financing

The types of first mortgage financing for office buildings generally include the ordinary form of first mortgage and the amortizing form, for which funds are obtained through the sale of mortgage bonds. The ordinary first mortgage is a straight loan of approximately 60 per cent of the appraised value of land and building. This mortgage is made at the prevailing interest rate and for a period of from five to ten years. It is usually placed in the form of a building and permanent mortgage loan on which money is advanced during the various stages of construction, and the permanent mortgage is placed on the building after it is completed. Mortgage loans of this type are usually obtained through such channels as savings banks, life and fire insurance companies, land title insurance companies, and from estates whose funds are controlled by attorneys or real estate firms. It is customary to present the prospectus of an office building, including the architect's sketch plans and cost estimates, to various mortgage sources in order to obtain preliminary consideration and information as to the possibility of ultimately obtaining the mortgage money required.

First mortgage financing for office building through the issuing of mortgage bonds has become a highly favored method of obtaining the necessary

funds. In this field large mortgage bond companies have developed a highly specialized service through which an agreement is reached to provide the necessary building and permanent mortgage loans through underwriting an issue of mortgage bonds established as one lien on the completed building and land. The mortgage applications, presented in the usual way to such mortgage companies, are carefully checked for the proposed location and building plans, and suggestions are made by lending concerns regarding any practical changes which may occur to them in the light of extensive experience in financing such buildings. The mortgage loan obtained through such sources is actually of an amortizing type, being payable in even installments over a period of from 10 to 15 years. In view of the fact that the owner begins to reduce the mortgage the first year after the building is completed, it is usually possible to obtain a more liberal loan than by means of mortgages which expire completely at a definite time several years later. While the appraisals may be equally conservative, the amortizing feature reduces the hazzards of market rental fluctuations and rapid depreciation. The cost of obtaining first mortgage money of this type must of course include the cost of selling the bonds and the overhead and profit of the mortgage company. There is no standard basis on which this cost can be estimated, because the marketability of the bonds is determined by the conditions of the project. A general figure of cost, however, might be said to be from 9 to 12 per cent of the face value of the mortgage, which is taken as a discount and the proceeds given to the borrower.

The Architect's Commission

Before a final decision is made or a mortgage contract entered into, the mortgagee usually requires that working drawings, specifications and operating cost schedules be complete with dependable contractors' bids. It will be seen, therefore, that between the preliminary stages and the final stages of financing, someone must take the responsibility of employing the architect to carry out the work before a final agreement for a mortgage can be obtained. This responsibility rests either with the promoters or with the investors in the equity (the proposed owners).

It is presumed that a holding company has already been organized and at this stage has taken title to the land. Before proceeding with actual working drawings and specifications, the architect should be certain that his commission comes direct from the owning company or is approved by the owning company or the individual who may have acquired title to the land on which building is to be built. This is the requirement of the mortgagee in his dealings, and the architect should be equally sure that he is dealing with the corporation or the individual obtaining the mortgage loan so that he may be certain of eliminating the risk of non-payment as the project proceeds. Usually the original promoters do not figure as actual owners in the final stages. If the building is to be coöperatively owned by several of the larger users of the proposed space, it is customary to form a holding corporation for the amount of the equity, which includes the promoter's profit.

Participating in Financing

It is sometimes the case that a promoter or proposed owner of a building may not have sufficient funds to provide the necessary difference between the first mortgage and the ultimate cost of land and completed building. In such cases, the building contractor may be asked to take the second mortgage, or even the architect may be asked to participate by taking part of his fee in the form of debenture bonds or a similar interest in the equity. Usually, if the architect is asked to coöperate in this manner, he is actually paid about one year after his work is completed.

Another method through which assistance is obtained for equity financing is called "land participation," in which instead of paying in cash for the land the sellers agree to take a second mortgage for all or part of the selling price. Under such an agreement and in payment for such coöperation a somewhat higher price is usually paid for the land than if it were a cash transaction.

Where the project is highly speculative in nature, the direct borrowing of second mortgage money is sometimes resorted to. In such cases the first mortgage loan will amount to about 60 per cent of the total cost of land and building, and the amount borrowed on second mortgage will be from 15 to 20 per cent, leaving a small equity to be provided by the owners. Borrowing second mortgage money under these conditions is difficult and invariably involves paying a high premium, usually from 18 to 20 per cent of the face value of the mortgage.

Equity Financing

The term "equity" in a real estate operation means simply the difference in the cost or value of the land and completed building and the amount of money which is borrowed on mortgage; in other words, the equity is the necessary net investment or net value. There have been already touched upon some of the methods through which the necessary investment funds are provided. The various sources of investment money provide funds for the construction of office buildings of these kinds:

Investment for Single Occupancy. This type of building is financed by and planned for a large corporation which intends to occupy the entire building or to occupy a large portion of it, leasing the remainder at market rentals to help carry the overhead. In such cases all necessary equity financing is usually provided by a company or by an investor who erects the building for such a tenant under a long-term lease. In this type of project the architect is usually commissioned in the regular manner to draw up plans and specifications.

Coöperative Office Buildings. This kind of proj-

ect is similar to the single occupancy building except that several prospective tenant-owners form a corporation and mutually agree to provide proportionate shares of the necessary financing, in accordance with the space to be used by each in the building. Very often this type of project is promoted by a real estate operator, in which case the architect may be asked to risk some of his time in the preparation of necessary plans and cost figures.

Private and Estate Investments. Many office buildings are built for the purpose of providing a sound investment for funds of estates or individuals. The equity financing is provided in this manner, and the architect is usually selected without being asked to risk time in preparation of plans and cost figures.

Speculative Office Building Operations. Usually carried out by professional real estate speculators or speculative builders who provide the net equity themselves, after borrowing all possible mortgage funds and obtaining any participation possible in the equity financing. Such buildings are built for logical occupancy and for the purpose of resale as soon as they are well rented. Here the architect will often be called upon to risk his time in the preparation of plans and costs during the earlier stages of promoting the enterprise.

Leases and Leasehold Investments. Where land values are particularly high, a favorite method of developing office building projects is to lease the land on which the building is to be erected for a long term instead of making an outright purchase. Such leaseholds are usually contracted for a period of 99 years or for three terms of 21 years each or divided into shorter periods with renewal clauses.

Important Factors in Financing

It is quite obvious that both mortgage and equity financing are made easier in proportion to the increased excellence of architectural design; practical planning to meet local rental needs; the selection of good materials and equipment to lessen maintenance and depreciation costs; the introduction of any other factors which would tend to make the building more attractive from the viewpoint of the tenant, to check obsolescence, and to protect against direct loss and disturbance by fire.

This introduces the factor of insurance engineering, which is highly important, not only from the viewpoint of the owner and tenant but from that of mortgagee and investor. When the plans for the building have been tentatively drawn, the architect will find that local insurance companies, underwriting concerns and large insurance brokers and agencies maintain a service for checking plans and making suggestions for better protection against the origin and spread of fire. This service is called "insurance engineering" and involves a number of intricate points which would not ordinarily come within the scope of the architect's knowledge. By inquiring from fire insurance companies it will be possible to learn where such service is available locally, and it will be found that it is usually rendered without charge, particularly by insurance brokers or agents through whom the insurance can be placed by the owner in exchange for rendering such service. In planning many large office buildings it has been found that by calling in insurance engineering advice the rates of insurance have been cut to half or less. This point of safety against disturbance by fire proves to be very attractive to prospective tenants. Some of the details involved in insurance engineering service will be found in the article in this issue written by Rudolph P. Miller, President of The National Fire Protection Association. Architects are strongly advised to familiarize themselves with local sources of such information.

A definite aid in financing is the presentation of a carefully prepared prospectus which provides in detail full information covering the economic and physical aspects of the project. This prospectus should include:

Analysis of Proposed Site. Diagram showing location and dimensions of land, with an appraisal of its value by a recognized expert. A report should be given on the character of excavation and foundation work necessary, and sounding should be made if there is a question as to ground conditions.

Plans and Estimated Cost of Buildings. Should include an attractive perspective drawing, preferably in color, and clean-cut floor plans, well lettered and with all dimensions plainly indicated.

Outline Specifications. Should include a fairly complete description of major materials, finishes and equipment.

Building Costs. Based not only on the architect's estimate but on opinions by reputable building contractors, if possible, substantiated by actual costs of similar operations.

Analysis of Rental Market. Explanation of various types of rentable space to be included in the building, with evidence of local demand and market rentals based on opinions of real estate experts.

Income and Operating Cost Schedule. Preferably drawn up by experienced office building manager, and based on relative facts and experience. Figures should be conservative and subject to the careful analysis which may be expected on the part of mortgage companies and other investors.

Financial Schedule. A full statement of estimated costs and income, showing logical net profit and appraisal value of completed property under established rental schedule.

It is obvious that a complete and well presented prospectus of this nature develops confidence on the part of proposed investors and assures more serious consideration by mortgage money sources. If the building plans are efficient and the facts and figures given bear close analysis, the financing is made much easier for the owner. In presenting rental estimates, it is sometimes possible to include tentative lease agreements for stores or large spaces. This is evidence of the practicability of the project.

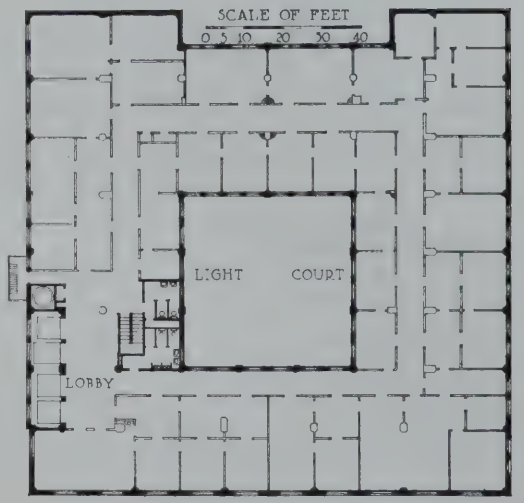
U. S. National Bank Building, Denver

W. E. & A. A. FISHER, Architects

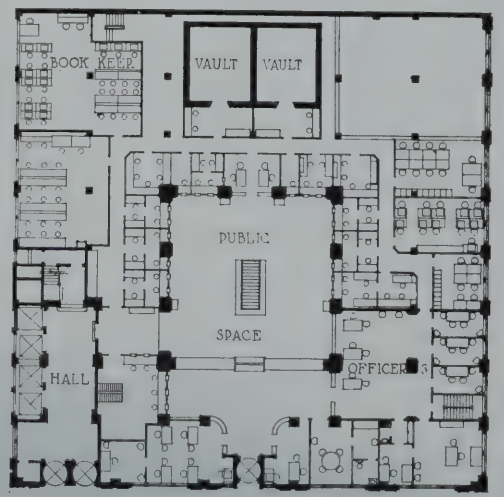
General View of the Building

THE U. S. National Bank Building, Denver, shows a simple and straightforward design in the Renaissance style, carried out in Indiana limestone on the street facades, with brick elsewhere. Cast iron ornament enframes the windows on the first and second floors and fills the spaces between the pilasters of the classic order which forms the base of the building. The entrance to the elevator lobby is at one corner,

Construction is reinforced concrete, flat slab system, for the floors; steel frame and girders for walls and floors. Heating is by vacuum steam. Electric service for lighting and elevators, supplied by city service. Finish of elevators: bronze in banking portion, baked enamel on steel for public service. Finish of entrance lobby: walls and floor, marble. Corridors: ceramic tile with black marble base; walls: wainscot and plaster.



Typical Floor Plan
Showing Possible Office Arrangement



Ground Floor Plan

The Office Building and The City

By EARLE SHULTZ
Past President, National Association of Building Owners and Managers

THE important part which the modern office building plays in the functioning of our American cities is probably not fully realized, even by architects, the banks, or the owners.

Last year the volume of production in the United States would have required the labor of two billion men 100 years ago. To handle this enormous output, probably one out of every 15 city dwellers is employed in a clerical or managerial position. As a rough average, 1 square foot of office space is required for each $2,000 of annual bank clearings of a city. In the 20-year period 1900 to 1920 the bank clearings of the 15 largest American cities increased from $7,325 per capita to $23,250 per capita, or over three times. This means that there is required today three times as much office space in proportion to the population as there was in 1900. Aside from New York, the other metropolitan centers have from 5 to 8 square feet of space per inhabitant. In New York the figure is probably 20 square feet of space per inhabitant.

The tall office building is the outcome of the demand of business for close coöperation and contact. The "loop" district of Chicago is built up to an average height of eight stories. In this area there are many distinct centers about which different lines of business cluster for the purpose of speeding up their operations. Imagine the disadvantage and loss if those businesses were housed in one-story buildings and spread out over eight times the area!

This necessity for concentration of business results in the building up of great capital values in land and building, not only in office buildings, but also in retail stores, hotels, theaters, apartment houses, etc. Under the present conditions, the earning power and useful lives of these tremendous structures are far less than believed by the public. The average income of 150 buildings in 45 cities of this country, according to figures compiled by the National Association of Building Owners and Managers, was only a little more than 4 per cent of the full value of land and building. In a study on the obsolescence of office buildings made a few years ago, it was found that the average term of existence of office buildings as first class is only 28 years.

There are several factors responsible for this unhealthy condition. Perhaps one of the most important might be termed the "growing pains" experienced by our rapidly developing cities during the last 20 years. In other words, the business districts which were adequate to house the business of 20 years ago very rapidly became inadequate with the increasing volume of business to be carried on therein. In developing to meet this situation, the business districts have, in most cases, been enlarged without any plan except the promotion schemes of speculative builders and the unnatural height limit restrictions imposed by zoning ordinances. Growth of our American cities shifts property values from one locality to another, and unless prevented by special conditions, business districts move one block in every five to ten years. This means that in from 25 to 40 years office buildings that were once well located for the highest class of office tenants are no longer in that district. Deterioration then sets in.

This tendency of a business district to shift has been much aggravated by two things:

1. By the unwillingness or inability of many owners, having property in the heart of the business district, to improve it adequately at a time when office space was needed.

2. By the speculative builders' deliberately putting up unneeded office structures outside of the business district, thus establishing new business centers to which values have been pulled, although at a heavy cost in vacant space while the district is developed.

Another very powerful influence on the shifting of business districts has been the fallacious idea on the part of zoners that high office buildings are unsafe, uneconomical, unsanitary and generally undesirable. As a matter of fact, there never has been, so far as can be determined, a loss of life by fire in a fire-resisting office building. They are much more sanitary and the living conditions in them are much higher than in the average home. The most injurious effect of height limitation is that it forces the business districts of cities to grow *horizontally* instead of *vertically*. This means an acceleration in the shifting of downtown property values that is extremely wasteful.

To understand the peculiar economics of office building investments, it is necessary to realize that office space is not a commodity, such as shoes, that is produced, sold and delivered to the purchaser. In office buildings it is only the *use* of the space which is sold. If an office building were to remain entirely empty, the taxes, insurance, depreciation and interest on the investment would require an amount equal to three-quarters of its entire income if rented. From this point of view the fallacy of speculative overbuilding in office space is very apparent, and overbuilding is also entirely unnecessary. In each city the requirements of office space bear a definite ratio to the population of the city. In Chicago, for instance, the yearly absorption of office space is six times the annual increase in population. The supply of office building space is a matter in which all the financial concerns handling office building securities should be vitally interested. Let us hope that the day is not far distant when office buildings will be recognized as essential services to the public and will be built as required and not for speculation.

Ashland National Bank Building, Ashland, Kentucky

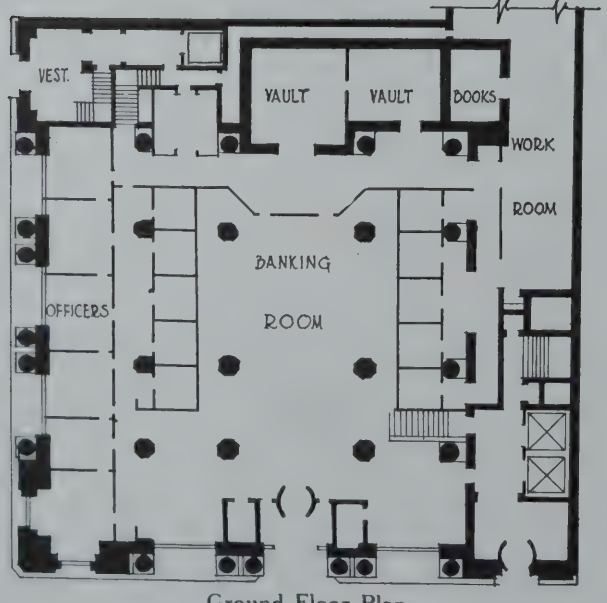
SCHENCK & WILLIAMS, Architects

Perspective Rendering of the Building

THE Ashland National Bank Building is a good example of a small city office building, showing consistency in its design and refinement in its detail. It is a tribute to the courage and foresight, as well as the civic pride of a commercial institution in a city the size of Ashland, that such a building should be built as a precedent to be followed by other ambitious business organizations.

The architectural details of the building are carried out in the style of the Italian Renaissance, using buff Indiana limestone for the two main facades, and buff brick elsewhere. Steel frame with reinforced concrete slab floors, is the construction used. A vacuum steam system heats the building. One freight and two passenger electric elevators accommodate the tenants. Entrance lobby floor is in colored marble, with walls paneled in Italian marble. Corridor floors marble.

Water for the building is provided by the bank's own well, carried down to bedrock; water is delivered through the building by a duplicate system of heavy-duty pumps, insuring a constant supply of water at all times. Every effort has been made to make this building one of the finest and best appointed in the country, a definite step forward in the city's development.



Ground Floor Plan

Typical Floor Plan

Office Interiors

By JOHN TAYLOR BOYD, JR.

TO make interior decoration a handmaiden of American business—this idea, in times not long past, might have seemed novel, but now it is becoming familiar. Today the more progressive leaders of the commercial world hold no prejudice against art, and are as willing to make use of it as of anything else which serves their purpose. They are asking, "Is it profitable to force people to work, for the greater part of their waking hours, in bleak, cheerless, badly proportioned offices with bare walls and clumsy furniture, when elsewhere, in home or club or church, they are becoming accustomed to beautiful surroundings?"

A generation ago the answer to this question might have been, "Why not? People who work should keep their minds on the job and not be looking at the walls!" But those were our more Spartan days, when American civilization was narrower, and when the weaknesses of modern commercial and industrial life had not stood forth so clearly. We had not then felt keenly the intensity, the standardization and the mechanization. Since then human nature has revolted at too-barbaric practices, and those practices are beginning to give way, as often happens. Today the impulse is to make business more human. Hygiene was first called in to establish saner working conditions, thus overthrowing the older dictum that people are not in business for their health; and more lately, architecture is asked to make these working conditions more beautiful.

This development is scarcely a generation old. It began with the more monumental buildings, particularly of those companies whose profits depended on attracting the public with fine display. First appeared, toward the opening of this century, the great city banks and railway stations and a few fine stores. At first, emphasis was on the exterior. Interiors of architectural merit were confined chiefly to the huge rooms for public use, like the banking halls and the concourses of the metropolitan railway stations. The practice spread, until now there is no type of business structure in which, in the most progressive examples at least, one will not see evidences of an effort to make the business environment beautiful.

"Interior decoration" in its purest form is invading business. Here again, the public gets first consideration from the business man. Who does not know the luxurious "outer" office, with carefully

Office of the President, American Press Association, New York
Leigh French, Jr., Architect

DIRECTORS' ROOM

PRESIDENT'S ROOM
BORDEN BUILDING, NEW YORK
BUCHMAN & KAHN, ARCHITECTS

City Editor's Room, *Evening News*, Detroit
Albert Kahn, Architect

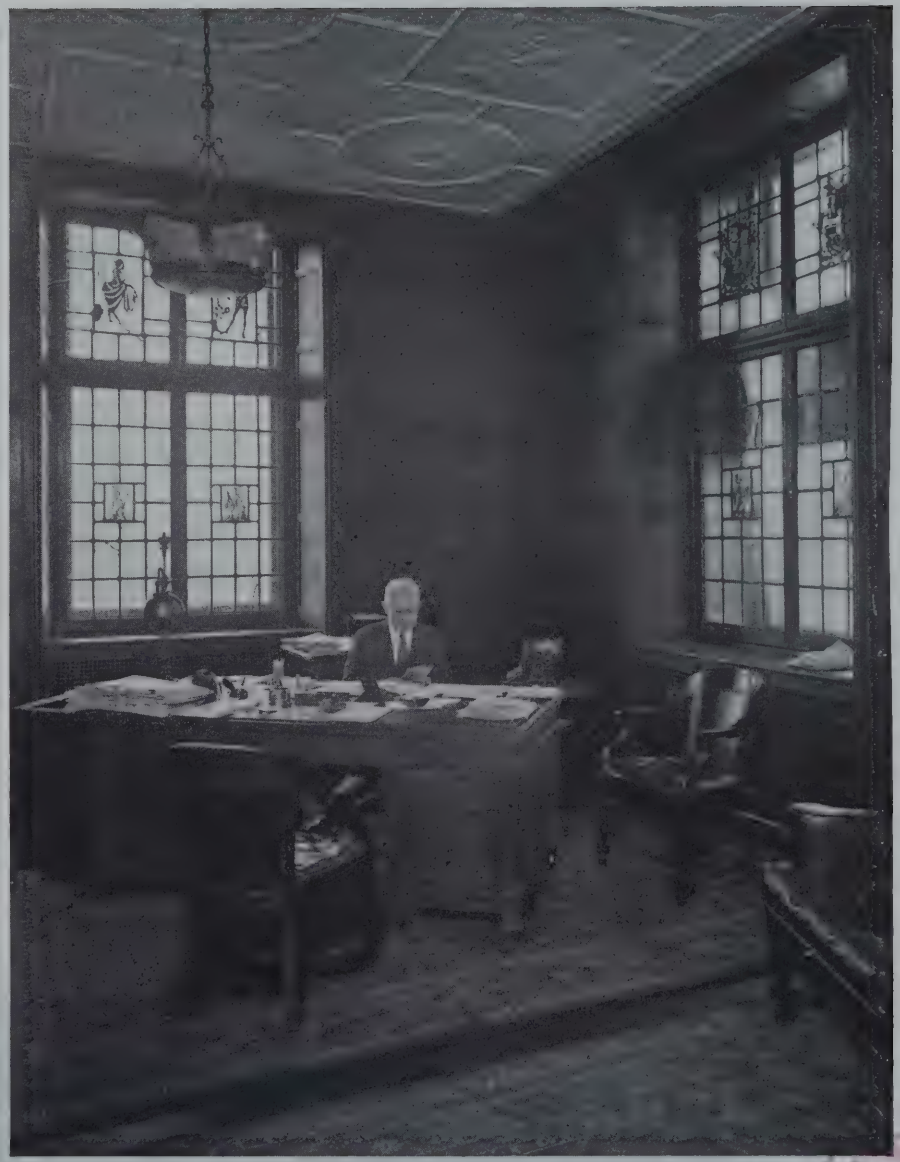
decorated walls in pure, but subdued colors, and period furniture in quiet taste? Or the customers' or clients' reception room, where deals are closed—or where an architect clinches a commission—in an atmosphere of paneled oak, ancient furniture, stained and leaded glass! In such surroundings Bassanio in "The Merchant of Venice" may well have obtained his celebrated loan from Shylock. With such settings does the twentieth century attempt to stage again the old romance of commerce. And if our stagecraft seems at times too obvious, we must keep on in patience until practice brings the ease which marks a finished work of art.

One sign of progress is that no longer is it only the customers and the officers and directors who are well provided for in the better establishments, for interior decoration in business is serving the working people as well. Business architecture is becoming democratic. To many, this development is the most interesting. One may note much of technical value in the illustrations of the offices of directors and chief executives, but what arouses enthusiasm is such an interior as the editorial room of the Detroit *Evening News,* designed by Albert Kahn, whose fine monumental design of beamed ceiling and plain plaster walls, giving relief and scale by the paneled oak screens which form the alcoves for the individual workers, seems to breathe the very spirit of business architecture. It is no effect of club or mansion carried over into business, but is characteristic of business alone. How different is this from the older American newspaper office of the Victorian age! One thinks of the office of the Brooklyn *Eagle,* the journal which Walt Whitman, as a newspaperman, helped make famous—a vast, shapeless space, a jam of desks, railings and files, a thick litter of paper, a clatter of typewriters, telephones and telegraph, amid which shirtsleeved men, working like bees, darted about. From such picturesque and very human surroundings, though discordant, the modern newspaper began to graduate but a few years ago into the spacious, precise, orderly and efficient and thoroughly mechanical quarters of modern business organizations, as might be seen in the offices of the New York *Times,* or in fact in many another new office.

But with such offices as these of the Detroit *Evening News,* the newspaper undergoes a third transformation. It becomes more than a practical business office, efficiently planned, well furnished and equipped; it takes on architectural form, amenity, style. When business has done this for its workers, it has not pampered them with luxurious trappings, but it has made their environment harmonious and even attractive. It has taken steps to restore the human atmosphere which business often had in the days of smaller units.

Board Room, J. E. Aldred & Co., New York
W. & J. Sloane, Decorators

LIBRARY AND EDITORIAL ROOM



THE EDITOR'S OFFICE

THE *EVENING NEWS* BUILDING, DETROIT

ALBERT KAHN, ARCHITECT

PUBLIC LIBRARY

The Mechanical Equipment of Office Buildings

By CLYDE R. PLACE, *Consulting Engineer, New York*

THE modern office building as now erected in the large cities may be rightfully compared to the human body in that its form is artistic; the steel frame is the skeleton; the foundation, the legs; the elevators, the arms; the windows and light, the eyes; the ventilation, the lungs; the heating system, the heart and blood circulation; the acoustics, the ears; and the sanitary system, the digestive organs. Consequently, these modern office buildings demand that all their mechanical systems and equipment shall be as nearly right and efficient in their installation and operation as are parts of the human body. In this article it is the purpose to review, briefly, the basic design and general present-day practice that combine to bring out the working part of the office building.

Heating

The general heating system now adopted is the two-pipe, low pressure vacuum system with the radiators placed under the windows, either on legs or brackets. The adoption of such a system has resulted because of the quickness and effectiveness of the steam circulation, the smallness of its pipes, and its quietness.

The steam supply for these radiators comes from a main supply loop in the basement or in one of the upper stories. In the former case the steam is fed up, and in the latter the steam is fed down. The down-feed system may be used to advantage when the lower section of the building is used exclusively for banking space or stores requiring heat at different periods than the office portion. For this section a separate and independent up-feed system is used, and this does not necessitate the heating of the entire building to accommodate the store or bank portion. If the building covers a large area, over 200 by 200, often the heating mains are sectionalized to apportion the heat and not to necessitate shutting down the entire building for repairs.

In special finished spaces, such as banking rooms, private offices and the like, the radiators are generally provided with grille enclosures. Where exceptionally high winds are encountered the down drafts from windows must be considered and eliminated or moderated by special adaption of baffles and radiation.

The heating of interior corridors is not found necessary unless ends of corridors terminate with windows at exterior walls; but for entrance vestibules ample radiation properly placed must be installed to care fully for the heavy inrush of cold air when entrance doors are being opened.

All large mains and enclosed piping are covered; radiator branches and exposed risers are not covered. The tendency nowadays is to use welded nozzles on the large steam mains, so as to do away with the numerous joints and extra fittings, and thereby decrease the possibility of future leaks.

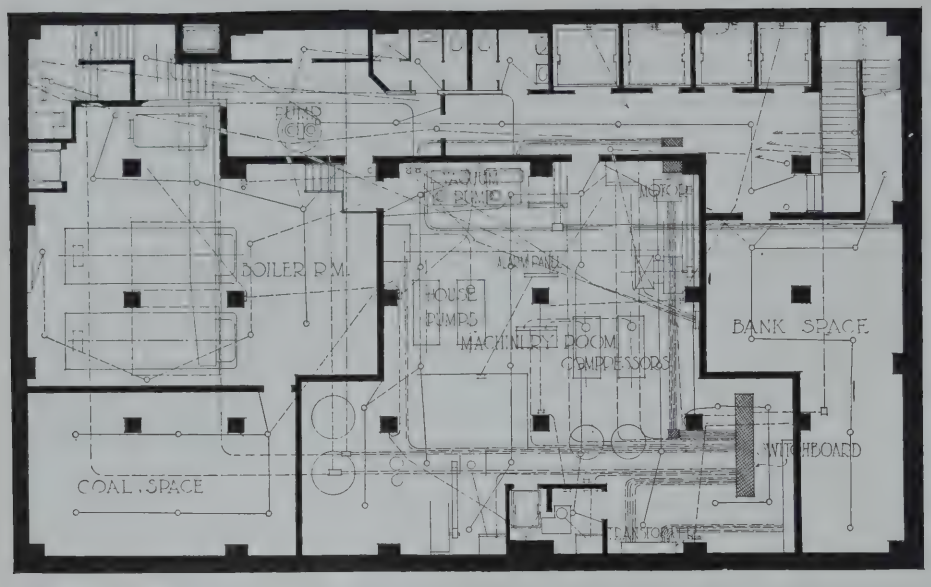
Ventilation is not provided to any great extent,—especially in office buildings designed for rental purposes,—except for interior toilets and basement sections. If the lower and basement floors are intended for banking or restaurant purposes, air intake and discharge shafts must be provided to accommodate future ventilation apparatus. Special consideration must be given to the utilization of the basement spaces, and if they are likely to contain any great number of people, the psychological aspect of ventilation or the perceptible movement of air must be considered, as well as the proper quantities for purity of air according to accepted standards. Safe deposit vaults must be extremely well ventilated, generally by a pressure fan system with the addition of oscillating fans. Where large office buildings are constructed for single occupancy of insurance or other corporations and many persons are on one floor, ventilation should be provided for these occupants. Temperature and humidity control are not now generally used in office rental buildings, but for structures occupied by insurance companies or large corporations they may be considered.

The selection of either coal or oil for fuel cannot be made a hard and fast rule. Degree of availability, insurance and continuous supply, comparative costs, amount and location of storage and volume of combustion chambers, are all determining factors for analysis and decision. Generally the office building has its own heating boilers with power-driven vacuum pumps to take the condensate from the radiators and the heating mains and return it to the boilers. Occasionally, if the building is located conveniently near a large central heating plant and steam rates are economically available, steam service is obtained from this plant.

Boilers for large office buildings are generally of the steel shell water or fire tube type, either brick set or portable in battery formation with high settings and large volume combustion chambers. Both hand and mechanical stokers are used for firing.

Plumbing

Water Supply. One of the essential details of the plumbing system in the building is the matter of adequate water supply and proper method of piping to the various utilities and fixtures. The location, size and pressure in the neighboring public water mains are an important consideration in the final determination of the piping scheme and the amount of building storage to be considered. The pressures carried on the public mains vary with the amount of consumption in the community, and it is well to store a



Electrical System Plan of Sub-basement, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects

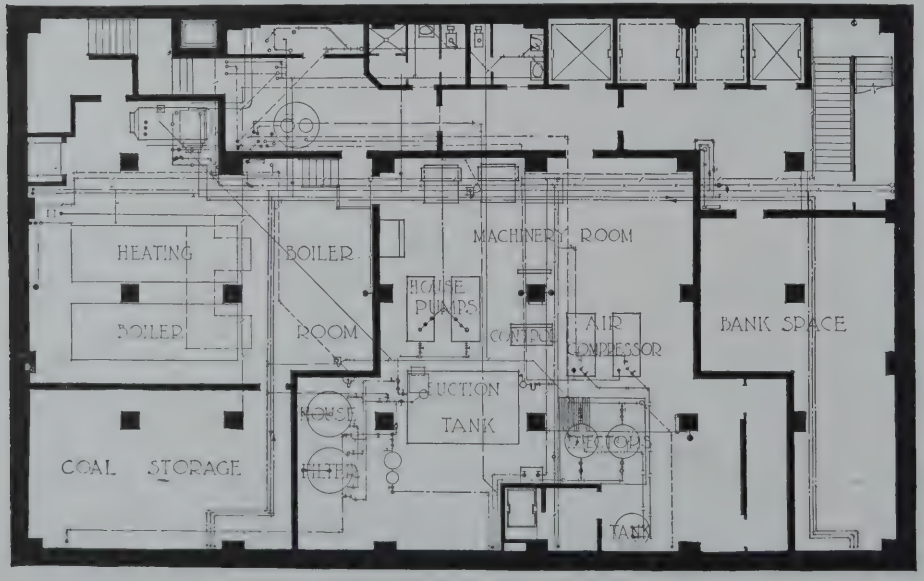
supply to carry over during a low period or in case of a total loss of the supply due to a break in the public utility service. For this reason it is well to place a large tank above the highest fixtures and to supply it by gravity. When the height of the building is greater than the working water head on the supply from the street, pumping must be considered, and it can be so arranged that it can be automatic in every respect.

There are various types of pumps which can be used for the purpose. The centrifugal pump with open impeller is usually considered the most advantageous because it will permit the passage of the street pressure to find its own level, and then in itself sometimes overcome the use of the surge tank or basement storage tank for pumping. On the gravity supply from the house storage tank, and where buildings are high and the fixtures on house flow are supplied say above 60 pounds, it is well to install pressure reducing valves so as to maintain a moderate working pressure on all fixtures. Intermediate tanks have been considered, but in view of the valuable floor areas taken up by these tanks, the overhead loop piping in the office ceiling, and the initial cost of the multiple systems of pumping necessary, it comes back to the individual reducers on the branches to the fixtures.

Hot water supply in buildings is always a valuable rental asset and may now be considered a necessity. Various systems can be used for the circulation of the heated water, and the right system for each individual building is a matter to be considered. If possible, it is best to run the hot water piping in such a way that the temperature of the water will cause the water to circulate by gravity, provided the pipes are not air-bound or locked and no traps are installed in the piping. Pumping is also used in very large buildings.

The tank for hot water is usually placed in the lower part of the building and the water heated by steam from the building's heating boilers or by a separate boiler unit, which can be used independently during the summer. It is well to meter the separate items as cold water and hot water for consumption.

In the course of construction of a building, water supply is a known requirement, and for construction purposes temporary piping provided with hose end bibbs is often installed. An analysis of the local water supply, which should be made, usually determines the amount and kind of filtration necessary and whether water softening is required.



Plumbing System Plan of Sub-basement, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects

Plumbing Layout: It is well to consider the future requirements of the tenants of a building in determining the layout of the rentable floors in an office building, because when partitions are installed and some-

times taken down and installed in other locations, the same thing is likewise done with the plumbing fixtures, and in locating the risers it is well to keep all these changes in mind. The riser lines are preferably placed by the interior columns.

The drainage system should be made up of proper sizes and run in such a way as to eliminate sharp turns and allow for proper pitch. Stoppages usually result because of lack of care in designing these features. The drainage of the soils, waste and the like, is by gravity to the public or private services. Often fixtures are located so that they are below the sewer, and for this reason automatic pumps or ejectors have to be installed.

The proper method of ventilating a plumbing system should be carefully studied. Throughout the whole country municipalities have entirely different methods of venting systems, each being called for as its own approved system. Many of them could be greatly improved upon. Toilets are sometimes located in such a manner that windows to the outer air are impossible, and in such cases a system of forced ventilation should be installed. The piping installed in office buildings should always be of such quality and workmanship as will assure a great degree of permanency, and pipe spaces or shafts should be located in such a manner as to allow easy access in case of repairs. All trunk lines should be assembled in one available shaft.

Toilets and Fixtures. The accommodation for toilet fixtures should never be for more than say 15 persons per toilet water closet, and the toilets should be arranged and located in such a manner so as not to waste valuable rentable floor area. Basins are usually installed in the offices, and when none are installed therein it is well to provide a lavatory in the toilet room,—about one for every 20 persons; when office lavatories are installed, a few should always be located in the toilets. The types and makes of fixtures should be selected and the fittings for them carefully compared before final selection is made.

In the office spaces usually *roughings only* for lavatories are installed, and it is well to include about 33 per cent of the fixtures as per the number of roughings installed, the fixtures to be installed as directed when spaces are rented.

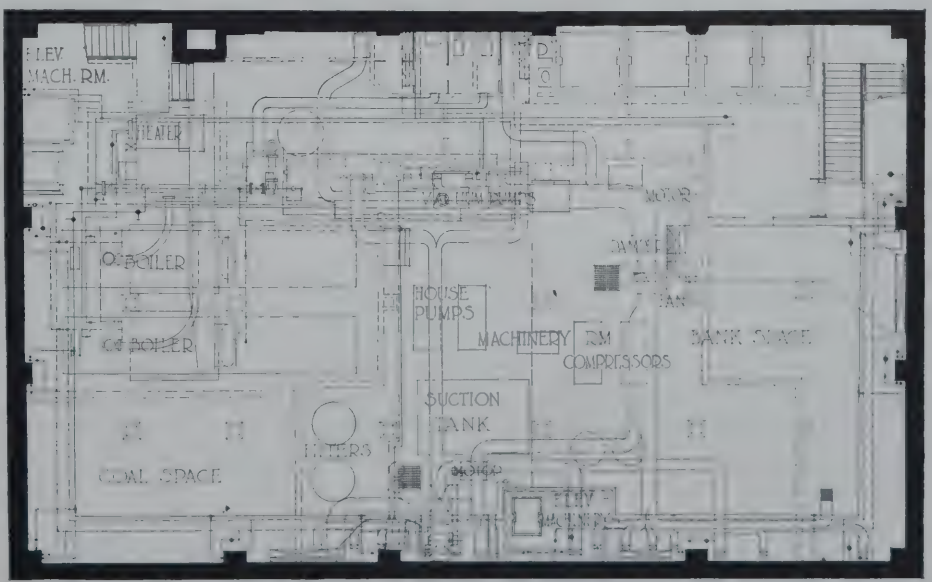
Fire Protection System. The fire protection system for an office building of any nature must never be overlooked. The best position for the hose rack is in the stair location, as lengths can be extended from other floors to the location of a fire. This gives persons using the hose an opportunity of backing away from a fire to the last resort, which is the stairways.

A reserve of water, generally in a separate compartment of the roof tank, should always be maintained in office buildings for fire purposes, for use before the arrival of the fire fighting apparatus. In large office buildings it is good practice to install an automatic fire pump in the basement to take the water load prior to the arrival of the city fire apparatus. In tall buildings, when pressures on the hose are excessive, say above 80 pounds, reducing or pressure regulator valves must be installed on the risers or at the hose outlet control valves.

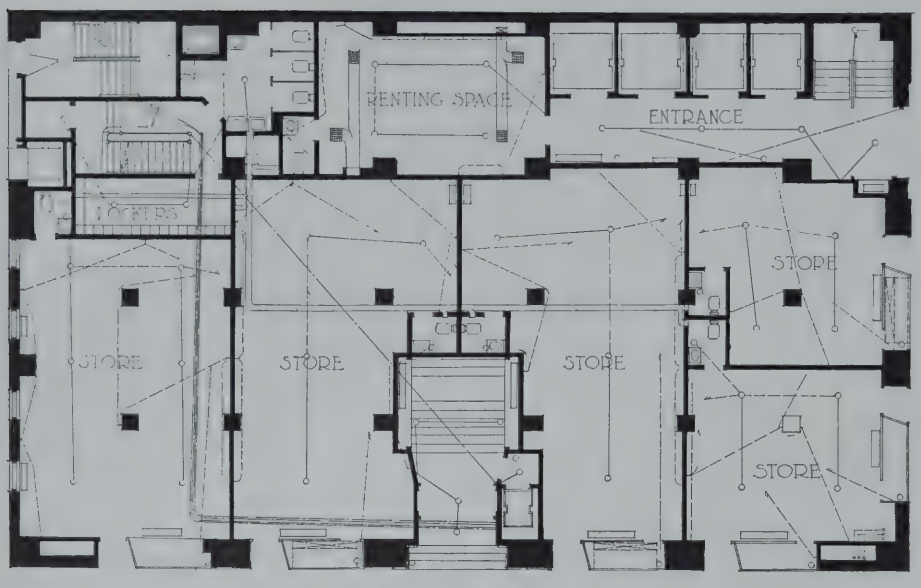
Electrical Service

The characteristics of electrical current available throughout the country vary to a considerable extent and are an important factor in the design of the electrical systems in buildings. Throughout the large cities direct current is usually available, this being of 3-wire, 120-240 volts. This current is gradually being changed in some cities to alternating current. In the outlying districts of larger cities, and in smaller cities, towns and other municipalities, the current is generally found to be alternating.

Unlike the direct current, the alternating current is available with a great number of different characteristics. The cycles generally vary from 25 to 60; the phases may be either 1, 2 or 3, and the voltage anywhere from 120 up to that generated at the power plant, which may be delivered to the building at 2200 volts or over. With alternating current, the voltage general in buildings is reduced to 120-240 by means of transformers. The transformers for small installations are usually located on the power company's poles, and for larger installations the transformers are installed in trans-



Heating and Ventilating System Plan of Sub-basement, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects



Ground Floor Plan, Showing Plumbing, Electrical, Heating and Ventilating Systems, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects

former vaults located inside the building. These transformer vaults are usually provided by the owner of the building, and transformers and primary switching equipment are furnished and installed by the power company. These transformer vaults must be ventilated and drained independently of the building or sewage system.

Where poly-phase current is furnished to the building, the power equipment is usually operated on current of the phases as delivered and the lighting split up on single-phase circuits, these being balanced as nearly as possible to give equivalent load on all phases entering the building. The 120-240 volt current is taken from the transformer vault to the main switchboard in the building, and from there distributed to panels and all points of utilization.

Isolated Plants. In large developments the question of generating electrical energy in the building or the purchasing of current from the power company is generally brought up, and a careful analysis must be made to determine if current can be manufactured more economically than purchased, and under which plan the service would be more reliable. The continuity of service is an important factor, especially from an industrial standpoint, where a shutdown of the manufacturing plant means a considerable monetary loss to the owners. The basis for the decision upon installation of an isolated plant is lengthy and complicated, and cannot be discussed here. The tendency in large cities, where the majority of office buildings occur, is to use central station electrical energy for lighting, elevators, fans and pumps rather than install independent generating plants.

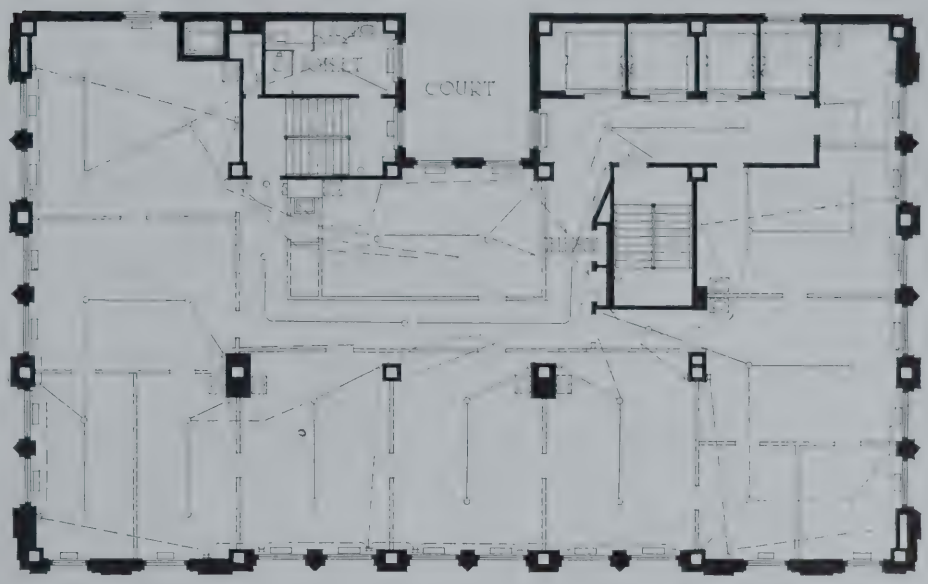
Current Consumption. In determining the income to be derived from a contemplated building, it is generally necessary to make an estimate of the current consumption for the year, this to be added to the other operating expenses. No hard and fast rules can be given for current consumption in buildings, as this varies with the character of the building, its location, the surrounding buildings, and the character of tenants who will occupy it.

Electrical Outlets. The outlets throughout the building are located according to the type of tenants and the character of business to be carried on in the building. These outlets are located so as to give good general, uniform illumination throughout the working spaces, and are spaced on varying centers depending on the character of fixtures to be installed, height of ceilings, spacing of beams, and special illuminating conditions. Generally for offices the lights are controlled by push-button switches, located on the office sides of corridor partitions at doors on opposite sides from hinges.

In buildings where the locations of partitions are not determined, where whole floors are likely to be rented to one concern, and where the partitions will not be erected or determined upon until the electrical installation is installed, the switches cannot be installed in position as just noted. It is then necessary to either place the push-button switches on columns or to provide pull boxes on ceilings for future extensions as concealed work in partitions or extensions as exposed work on the faces of partitions. In most large office building operations the majority of offices are leased from the plans, and the tenants' changes and locations of partitions can be determined before the completion of the roughing of the electrical installation.

Panels. The electrical circuits are collected from the various outlets or switch positions and extended in conduits to panel board locations. These panel boards are located at various points throughout the office building floors, the number varying with the size of the building and with the positions available for shafts and the maximum run allowed for the pulling of wires and uniformity of voltage drop. In very small office buildings it is sometimes permissible to install a panel board on every third floor, a panel board taking the circuits on the floor on which it is installed and from the floor directly above and the floor below. The panel boards should be located one above the other for ease of installation and facility of pulling of the cables. The cables are usually connected to several panel boards and fused cutout in panel, and these cables extended down to main line switches on the main switchboard.

The panel boards throughout the building may be of the "knife switch type" with enclosed fuses, or of the "safety type" with enclosed fuses, or switches may be omitted entirely and simply the "cartridge" or "screw type" fuse installed for each circuit. The panel boards are enclosed in sheet metal and are either placed in a separate closet with a standard door or recessed in partitions and provided with smaller doors and trim to match the interior finish of the rest of the building.



Typical Floor Plan, Showing Plumbing, Electrical, Heating and Ventilating Systems, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects

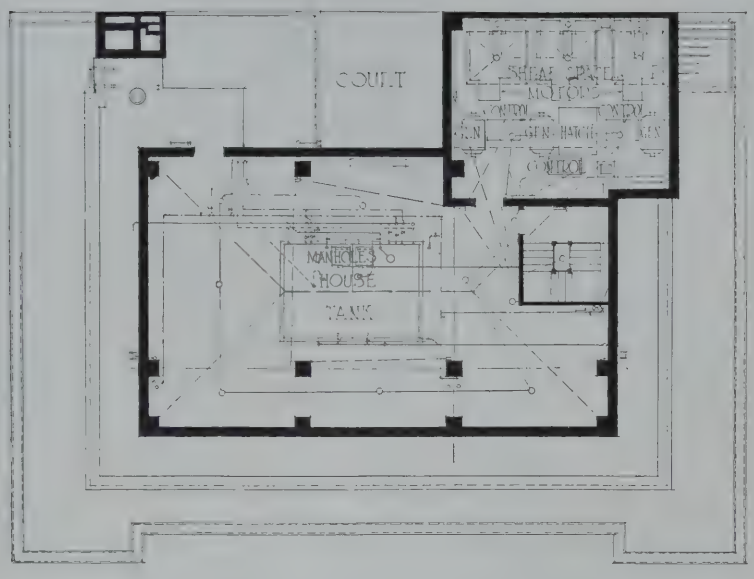
Generally cost of electric light for offices is estimated and included in the rental fixed per square foot of floor space. It is sometimes desirable to install meters for the tenants, and when this is done metering type panels are installed. These panels are so arranged that any one or a number of circuits may be combined and placed on one meter. The metering type panels are provided with frames, upon which the meters can be conveniently mounted. In order to facilitate the reading of these meters and to relieve the agents or owners of doing this work, there are now companies which are established for just this purpose and who for a nominal charge will install meters and read them.

The advantage of selling current to the tenants apparently lies in the fact that the owners are purchasing the current in large quantities and are billed at wholesale rates by the light and power companies, whereas the owners in turn sell to the tenants at retail rates.

Wiring Systems. In office building work it is not generally customary to install any complicated conduit or wiring system for flexibility or possible changes desired by tenants. The conduit system and outlet boxes are located for uniform and even distribution of light, and for economy of original installation. If re-location of outlets is desired by tenants, this work is generally due at tenants' expense, as what are known as "tenants' changes." It is not economical from an investment standpoint to endeavor to install any electrical illumination system that would meet the desires of all the tenants, and that would be adaptable to the needs of all. The electrical illuminating system is generally so designed and operated that the drop in voltage throughout the building is uniform.

Special Problems in Office Buildings. Generally, in large office buildings, the lower floors are devoted to stores or banks. Where banking facilities are installed, usually in conjunction with safe deposit departments, the electrical facilities demanded are numerous and the locations of outlets are dependent upon the equipment to be installed. Electrical equipment for banks, comprising the general illumination, illumination of working space, tellers' cages, officers' quarters, and the mechanism of daylight raider, vault protection systems, telephones, telegraphs, telautographs, burglar alarms, time clocks, time stamps, call bell systems, and the like, is usually installed. These systems, the location of outlets and their advantages, are a subject too extensive to be considered here.

Telephones. The telephone system throughout the rentable portions of office buildings usually consists of one or more closets on each office floor, wherein the telephone company's strip boxes can be located. These closets have shafts in which the telephone companies can install their main telephone riser cables. The floors of these closets are usually provided with slots in the floor slabs which the telephone company uses as vertical rising shafts. The individual telephone lines from strip boxes are usually run in corridor picture moulding and from there through a sleeve placed over doors to offices, and the wires are carried in the offices concealed behind the picture mouldings. The main telephone cables are continued to the main telephone strip boxes, usually located in an accessible position in the basement. A conduit system is usually installed from this main strip box to the point of entrance of the telephone company's service into the building. In the large open work spaces under the floors, conduit systems are generally installed in conjunction with raceways in the baseboards. These systems are usually provided with outlets at predetermined points or are of such a character that they can be tapped into from the floor above and outlets installed at positions desired, after desks and other



Plan Showing Elevator Machinery and Tank in Penthouse on Roof, Liberty Title & Trust Co., Philadelphia
Dennison & Hirons, Architects

furniture are located. This obviates tearing up floors.

Fire Alarms. Generally, in the office buildings, there is a fire alarm system installed. This system may be of a local type or of a type connected to the fire department street service, depending upon the character of the service desired by the owner and whether or not he desires to take advantage of any reduced rate of insurance which might be accomplished by using the type of fire alarm system installed. This applies also to a watchman's system.

Mechanical Equipment. The character of electrical current delivered to the building affects generally the mechanical installation. For instance, alternating current delivered to a large office building, necessitates the locating of elevator machines in such a position as to eliminate any magnetic hum or other noises if the machines are driven by direct connected alternating current motors. This particular condition is being overcome at the present time through the adoption by the elevator companies of a small motor generator set for the operation of each individual elevator machine or each group of elevator machines. The motor generator operates continuously and delivers direct current to the elevator driving motors. The same general comments apply to the ventilating fans, some of which must necessarily be located on the upper floors of the building, and to the noise from them which will cause annoyance to the tenants. With direct current for driving fans, slow speed fans with direct connected motors could usually be installed, which would be practically noiseless. With alternating current motor drive, it is necessary generally to use a belted connection. Worm gear drives could be installed for operation of fans if the proper gear ratios could be obtained to give the desired fan speeds when operating with standard speed alternating current motors. Good fan service is important.

Generally the mechanical equipment in the basement can be operated on alternating current, unless the character of the machines to be driven is such that a number of continuous speed variations are desirable. Where alternating current only is available, motor generator sets are usually installed for large buildings such as hotels, wherein there are a great number of fans, which must be operated absolutely noiselessly. These motor generator sets deliver direct current to these fan units.

Elevators

The proper type and number of elevators are among the most important problems in modern office design. The present tendency is to use high speed elevators with quick and easy acceleration and retardation, such elevators to be of as simple a design as possible, without gearing or multiplication of cable windings. A successful office building must have such elevator service that a person should not have to wait to board a car over from 20 to 30 seconds, and there should be enough cars and sufficient capacity to empty the entire building of occupants and visitors, in case of panic, in at most 45 minutes. This service can only be accomplished by elevators having a speed varying from 550 to 750 feet per minute and with full electrical control.

Elevator machines and controls are located at tops of shaftways, and ample space should be provided around machines, signal apparatus and controls. Where elevator machines occur in buildings part way up, ventilation must be provided in the rooms to take away the heat generated.

The present gearless traction elevators are considered the most economical and safest type of high speed elevators on the market. Their simplicity of design insures, to a great extent, their safety. The control of this type elevator is exclusively by use of electrical energy, which is varied in degree of pressure as the starting, running and stopping periods demand.

The signal system now generally used is the bracket light flash over each shaftway door with flash light in elevator car. At the starting floor mechanical dials in addition to bracket lights are used to designate locations of elevator cars in shafts.

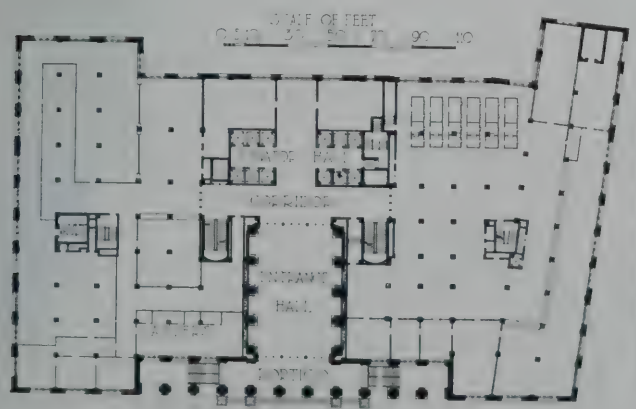
In a large bank of elevators there are located, in a visible place, target boards which show by small lights the progress of the cars up and down the shafts. This equipment assists the starter in determining the locations of all cars and assists him in their operation. The people generally will follow the operation of the dial at the starting floor, and will place themselves at car doors ready for entrance. For the starter's further control of the elevators, there is usually a telephone and call-back system to each car operated.

Municipal Building, Brooklyn

McKENZIE, VOORHEES & GMELIN, Architects

Perspective Rendering of the Building

THE new Municipal Building for the Borough of Brooklyn will be erected at the corner of Joralemon and Court Streets. It will be 11 stories high, and 15 stories in the central part. It will accommodate all the offices of the various city departments that are now widely scattered, occupying rented space in many office buildings in the neighborhood of the old Borough Hall. The H-shaped plan has been adopted to give good light and air to all offices. The construction and equipment will be entirely up to date and planned in accordance with the most approved practice in office building design. The entire exterior will be of limestone with granite base. The building will be simple in design, but will be adorned by a lofty colonnade serving as an entrance to the building and also to the subway.



Entrance Floor Plan

Typical Floor Plan

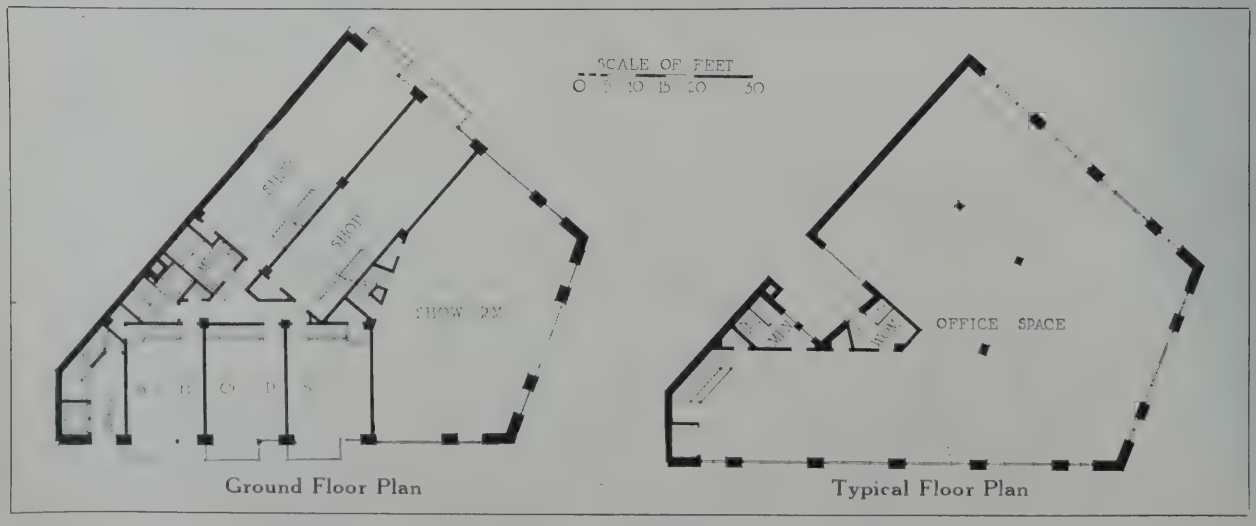
Semmes Building, Washington

GEORGE N. RAY, Architect

General View of the Building

THE Riggs Bank and the Semmes Building, Dupont Circle, Washington, adjoining structures, were built practically as a joint operation and show a harmonious treatment in their elevations. The major portion of the Semmes Building on the first floor is used for an automobile salesroom, and the remainder is leased as stores. A mezzanine is used by the motor company, and the second floor for offices.

These buildings are of reinforced concrete construction, faced with Indiana limestone. The banking quarters of the bank have marble floors, marble and bronze screens, and decorated plaster walls.



Ground Floor Plan

Typical Floor Plan

Modern Office Building Appliances

By B. H. BELKNAP

Brown, Wheelock; Harris, Vought & Co., Building Managers, New York

THE old adage that "It is the little things that count" may well be applied to office buildings, and with particular emphasis as far as the tenants' general reaction toward the building is concerned. The stability of the structure, the financing of the project, and the imposing architectural effect may pale into insignificance if there is a cold draft from the window or no available receptacle into which to plug the new electric fan just obtained for the President's office! Much is made of small things.

The question of satisfactory windows is of primary importance to the tenant, from whose point of view the window must provide for three things: light, ventilation and complete protection from cold and storms. The matter of light is naturally largely a question of the general fenestration and exterior surroundings. There is no type of window which possesses as many advantages and as few disadvantages as the double-hung window, properly weather-stripped. The small office may, and usually does, depend exclusively on the windows for ventilation, and satisfactory results can best be obtained without objectionable drafts with the double-hung window. The selection and installation of window ventilating devices may well be left to the occupants of the offices. The expense involved will probably never be considered a proper charge against the building, and the preference of the individual tenant will generally be found decided, although perhaps not especially enlightened.

The proper ventilation of large units of office space is impractical if dependence is placed on the windows alone. The only solution of this problem is the installation of blowers and distribution ducts. Any type of window which must remain open or partially so for washing on the outside is objectionable in cold weather. Every office building should be provided with properly secured safety bolts for the use of window cleaners, although they are required by law in New York only on mercantile structures.

On buildings having a southerly exposure it is desirable, if not absolutely necessary, to make some provision other than that afforded by window shades for the exclusion of direct sunlight in summer. This may, of course, be accomplished by the use of awnings, which, however, are not without serious disadvantages. While not particularly expensive in first cost, the annual installation, removal, repairs and storage represent a large outlay each year. Awnings are without question a fire hazard, for building occupants will persist in flipping cigarette butts out of open windows, and the fireproofing of awnings is not practical. Awnings when down make offices much darker, and lights will be burned which would otherwise be out. The outside appearance of a building is certainly not improved by awnings, even when new and of a color harmonizing with the exterior. The use of Venetian blinds to replace both window shades and awnings is worthy of serious consideration in many buildings. The improved daylighting and ventilation of offices may well provide increased revenue, and without doubt constitute a form of service which it is difficult to secure with other means.

There are many days during the year when even a light office will require artificial illumination, and the importance of the proper lighting layout and the selection of the right fixtures are paramount. The old fashioned desk lamp has no place in the modern office. The general illumination should be sufficient so that individual lights are unnecessary. The question of how much light is required is important, and the answer depends on the nature of the work being done. Provided the source of light introduces no glare and the illumination is uniform, there is no such thing as too much light within the practical possibilities of furnishing it. As it is now the general practice for tenants to pay for the electricity used in their offices, adequate lighting may be provided without reacting unfavorably on the operating costs of the building.

The outlets for fixtures should be arranged symmetrically and not more than 10 feet apart, the exact spacing depending on the sizes of the offices. Except from the standpoint of keeping it clean, the ordinary semi-indirect fixture with properly diffusing glass is the most practical for general office lighting. There are now available several types of totally enclosed fixtures, the easiest to keep clean, which also retain the advantages of the semi-indirect fixture in efficiency and appearance. In laying out lighting circuits provision should be made for moving fixtures due to possible future rearrangement of the space. Ceiling lights should be operated from side wall or column switches, and not more than two lights should be included in one circuit. Fan outlets should not be overlooked, since the electric fan is a standard office fixture today.

Next to the lighting and ventilation of his office, the tenant is probably more concerned with the matter of cleanliness than anything else. While supplying this service lies largely in the province of the building management, there are a few points which may properly be considered here. If the offices are large, the use of mopping trucks will greatly facilitate this work, and the porter's closets should not only be large enough to accommodate the truck but if possible should have floor drains so placed that the two tanks on the truck may be emptied direct to the waste lines. Provision for the use of these trucks may make it possible to

eliminate a slop sink on each floor, which would be required if ordinary pails were depended upon.

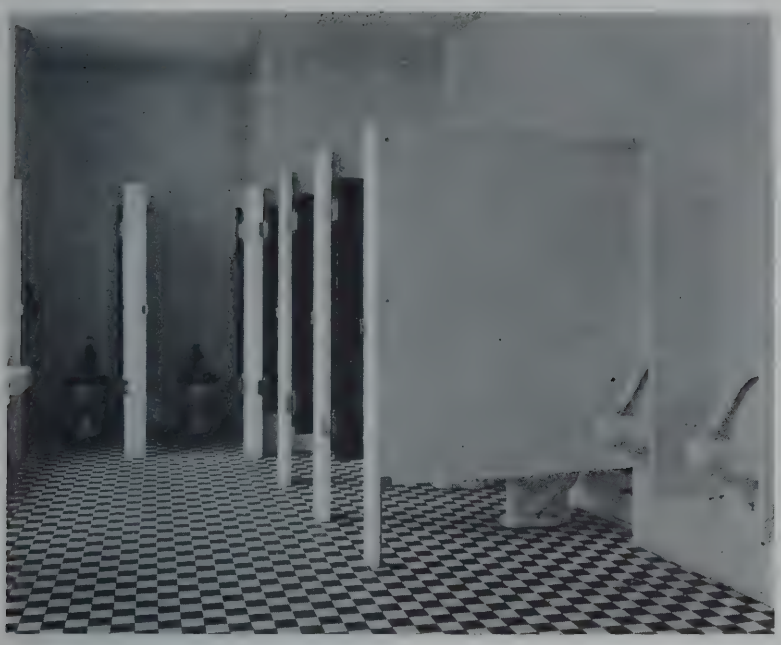
Vacuum cleaning is indispensable in the modern office building. If the installation of the central stationary vacuum machine is decided upon, the piping should receive the most painstaking care as to layout and installation, since the efficiency of the system is greatly affected by minor details of fittings, pipe sizes, etc. In general, the piping work should be done under a separate contract rather than be included with the plumbing or steamfitting. The modern portable machine, mounted on a light rubber-tired truck, meets the usual office building requirements, and the work will be done at less expense if the first cost of equipment is figured upon. If the halls are large, one or more outlets should be provided for the use of electric scrubbing machines. These machines usually have attachments for waxing and polishing linoleum and may therefore also be used in the offices, which should be provided with outlets for the purpose as well as for the use of the vacuum cleaner.

The standard of finish and equipment of toilet rooms in modern high class office buildings has reached a point where even the most particular and fastidious tenants can hardly fail to be favorably impressed with the provisions made for their comfort and convenience. This fact was humorously illustrated by two American "doughboys" who had just returned from overseas. Upon entering a toilet room of one of New York's finest office buildings, one was overheard to exclaim to the other, "Say, Buddy, if a Frenchman came in here, he'd think he was in a toilet in Heaven!"

There is perhaps nothing more attractive for the side walls and partitions of toilet rooms than slabs of white opaque glass. Light Tennessee marble or white tile and marble are just as sanitary, and choice is largely a matter of personal preference. Too much care cannot be exercised in properly anchoring all slabs supporting doors, as otherwise the weight and impact of the door will loosen the slab, which may fall without warning. The closet doors should be arranged so that they are normally open, a spring hinge being used with a combination coat hook and door stop on the partition slab against which the door opens. In tall buildings served by only one house tank on the roof, it should be borne in mind that the water pressure will vary from a few pounds per square inch on the top floor to perhaps 100 pounds or more in the basement. Flushometers and valves should therefore be specified to suit the varying conditions of pressure. Wood is no longer an acceptable material for toilet seats, as the composition seats possess such obvious advantages as being more durable and sanitary, non-warping, easier to clean, possessing permanent finish, etc. Modern ideas of personal hygiene demand that toilet paper in a public toilet be contained in a receptacle from which it may readily be removed by the fingers, touching only the paper taken out. The same argument applies with perhaps greater force to the method of dispensing paper towels, which are now regarded as the only suitable towels for office building use. If soap is provided in the toilet rooms, it should be of the liquid variety, and the holder should be of strong construction to stand hard usage. There is a marked tendency at present, which should be encouraged, to place wash basins in offices and for the building to supply the tenant with individual towel and soap service. This is not only a source of revenue but appeals to the tenant as more sanitary and helps to solve the problem of keeping toilet rooms from being littered with paper towels.

Too much importance cannot be attached to the so-called secondary electrical distribution system. This is the low-tension system and includes wiring for telephones, annunciators, buzzers, etc. Where

Three Types of Windows in New York Offices of York & Sawyer, Architects



Typical Toilet in Pershing Square Building
York & Sawyer, Architects

offices are small it is practical to conceal the necessary wires in the baseboards or mouldings. In large offices this is obviously impossible. The most satisfactory system yet devised for meeting the requirements of this situation consists of a crosswork of semi-circular fiber tile laid on the concrete arches before the finish floor is put down and through which all necessary electric lines are run. By means of special floor outlets it is possible to set a desk anywhere on a large open floor and pick up all circuits without cutting a channel in the floor or exposing a conduit on the surface.

Interior partitions in a new office building are not usually erected until after the space has been rented. The tenant is then allowed to choose his own layout, and the cost of the partition work is amortized over the term of the lease. This is a very equitable arrangement and makes it possible to establish definite rental schedules, based upon "open floor" values. Tenants should be restricted, however, to certain typical layouts in deciding upon the arrangement of their offices so that the space may be readily rented to other tenants without expensive alterations. Obviously, all plastered partitions, with doors, hardware, etc., and all special counters, grilles, paneled walls and similar equipment although paid for by the tenant become the property of the landlord and are considered as parts of the building. Even portable wood and glass partitions are often specified in lease forms as "building fixtures" and are considered as parts of the building, particularly if their removal would result in damage to walls, floors or ceilings.

The question of disposing of waste paper from office buildings in New York is one of comparative simplicity. Paper is usually collected by cleaning women in large burlap bags which are removed from the various floors to the paper storage room by porters. These rooms should be well ventilated and large enough to hold the accumulations of two or three days. Waste paper should be held at the building for 24 hours in the bags in which it is collected, which should be distinctly marked, so that papers accidentally placed in waste baskets by tenants may be recovered as conveniently as possible. The baling of paper in office buildings is not a general practice, because paper must be sorted before it can be sold to advantage, and since office waste embraces everything from newspapers to the finest linen bond, the labor of sorting would be too expensive if performed by building employes.

Wherever possible in planning an office building provision should be made, either in the basement or in such locations as are not desirable from a rental standpoint, for storage space to be used by tenants in keeping their records, letter files, etc. Such storage rooms should be planned so as to be fireproof and can often be rented at very attractive figures. It is, in general, impractical to attempt to provide individual vaults as part of the building equipment, due to the almost prohibitive expense of making them actually burglarproof.

In addition to properly lighting the interior of an office building, many projects now also introduce the problem of exterior lighting at night for advertising purposes. It may be said without fear of contradiction that such lighting has no practical effect upon the rental value of office space in the building and serves only to advertise the building itself or the company or institution which it represents.

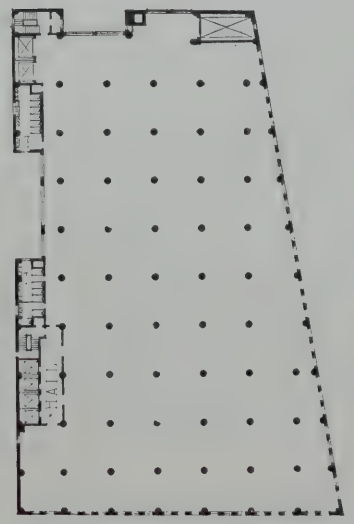
The flood-lighting of many downtown office buildings in New York would be impractical from an advertising standpoint because they are so surrounded by other tall buildings that an unobstructed view of them can be obtained from only one or two locations. Then, too, lower New York is practically deserted at night, and even if the buildings could be seen to advantage, there would be few to look at them. Flood-lighting should be very carefully studied, and used so as to be in harmony with the architectural motif. Artificial lighting cannot begin to equal daylight, and to attempt this result is usually to invite failure. An installation of lamps with a wattage of 50,000, together with proper reflectors, projectors, screens, etc., would probably be adequate for the ordinary exterior lighting project. If this lighting were used on an average of five hours per night and current cost four cents per kw. hour, the cost of electricity would be $10 per night, or $3,650 per year. To this amount should be added the cost of the bulbs, which would be about $400 per year, exclusive of the labor of re-lamping.

New Caron Building, Montreal

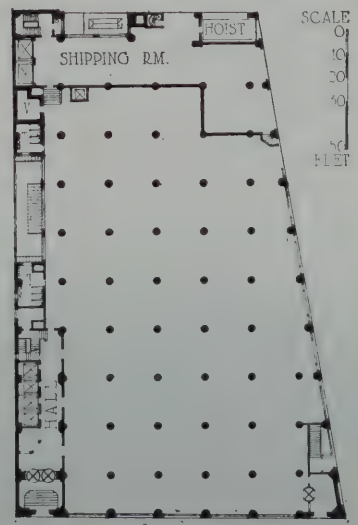
MACVICAR & HERIOT, Architects

IN the New Caron Building, Montreal, artificial stone was used for the two lower stories and trim, with gray face brick above. Construction: steel frame and reinforced concrete; slabs for floors. Heating: vacuum steam system. Electric service: three 50-kw. 2300-550-volt power transformers and three 75-kw. 2300-115-volt lighting transformers of oil-insulated, air-cooled type. Elevators of single-warp traction type. Windows: first floor, cast iron frames with steel sash; upper floors, double-hung, wood frames and sash. Corridor floors: pink Tennessee marble. Walls: polished Botticino marble. Cost: 35 cents per cubic foot in 1923.

Entrance to Ground Floor



Typical Floor Plan



Ground Floor Plan

General View of Building

Bibliography

A List of Publications or Articles in Various Periodicals which Deal with Different Phases of Office Building Design, Construction and Maintenance.

BUILDING LAWS

"Studies in Height Limitations in Large Cities." Chicago Real Estate Board. 1922.

CONSTRUCTION

"Erecting Office Buildings Over Complicated Track Layouts." *Engineering News-Record,* March, 1923.

"Reinforced Concrete in Office Building Construction." *American Architect,* Vol. CXV, January-June, 1919; p. 900.

"Sidewalk Protection During Building Construction." *American Architect,* Vol. CXXV, January-June, 1924; p. 74.

"Special Problems in Foundations of the Cunard Building." By Carlton S. Proctor. ARCHITECTURAL FORUM, July, 1921; pp. 21, 22.

"Structural Features of the Cunard Building." By S. O. Miller. ARCHITECTURAL FORUM, July, 1921; pp. 17-20.

"Testing Caisson Foundations." *American Architect,* Vol. CXXI, January-June, 1922; p. 447.

"Types of Elevator Lobbies in Office Buildings." By Cecil F. Baker. *Architectural Record,* December, 1915.

DESIGN

"High Buildings and Beauty." By Irving K. Pond. ARCHITECTURAL FORUM, Part I, February, 1923; pp. 41-44. Part II, April, 1923; pp. 179-182.

"A New Emphasis in Skyscraper Design Exemplified in Recent Work of Starrett & Van Vleck." By John Taylor Boyd, Jr. *Architectural Record,* December, 1922.

"Passing of the Skyscraper Formula for Design." By Leon V. Solon. *Architectural Record,* February, 1924.

"Planning Investment Buildings." By F. S. Marlow. *American Architect,* Vol. CXXIV, July-December, 1923; p. 263.

"Practical Phases of Office Building Design." By C. T. Coley. *Engineer and Contractor,* April, 1923.

"Production of High Class Office Space as Affected by Architectural Design." By J. M. Howells. *Architecture and Building,* August, 1923.

"Remodeling Old Buildings to Meet Modern Office Requirements." *Engineer and Contractor,* February, 1922.

ELECTRICAL

"Electrical Equipment of the Cunard Building." By Henry C. Meyer, Jr. ARCHITECTURAL FORUM, July, 1921; pp. 22, 23.

"Electrical Wiring Layouts for Office Buildings." By Nelson C. Ross. ARCHITECTURAL FORUM, July, 1922; pp. 31-34.

"Exterior Illumination," Wrigley Building, Chicago. ARCHITECTURAL FORUM, October, 1921; p. 135.

"Industrial Lighting in City Office Buildings." By C. F. Evans and J. W. Morrison. *Electrical World,* January, 1922.

"Lighting Offices." Illuminating Engineering Practice (Lectures). McGraw-Hill Book Co., New York. 1917.

"Recent Departure from Usual Lighting Practice in Public Spaces and Office Buildings." Illuminating Engineering Society, 1921.

ENGINEERING

"Live Floor Loads." By C. H. Blackall. *American Architect,* January, 1923.

"Live Loads in Office Buildings." By C. T. Coley. ARCHITECTURAL FORUM, April, 1923; pp. 199, 200.

"Mechanical Plant of John Hancock Building, Boston." By C. L. Hubbard. *Power Plant Engineering,* July, 1923.

"Radiator Trap Report." Committee on Research. Nat'l Ass'n of Building Owners and Managers. 1923.

"Water Service and Fire Protection for an Eleven-Story Building." By F. Cunningham. *Domestic Engineering.* 1922.

"Wind Stress in Steel Frames of Office Buildings." By W. Wilson and C. A. Maney. University of Illinois Engineering Experiment Station. Bulletin 80. 1915.

FINANCE

"Accounting and Exchange Experience Report for 1922 Nat'l Ass'n of Building Owners and Managers." 1922.

"Determining of Rental Profits." By Douglas Grant Scott. ARCHITECTURAL FORUM, April, 1923; Ser. 67, 68.

"Income and Operating Expenses; Accounting and Exchange Committee." ARCHITECTURAL FORUM, January, 1923; Ser. 71-73.

"Promotion and Financing of Building Operations." By Charles A. Whittemore. ARCHITECTURAL FORUM, February, 1919.

"The Rental of a New Office Building and Rental Values for Office Space." By W. H. Ballard. *American Architect,* Vol. CXXV, January-June, 1924; p. 447.

"Report of Rental Conditions in Large Cities of U. S." By J. F. Douglas, Chairman, Renting Committee, Nat'l Ass'n of Building Owners and Managers. 1923.

HEATING AND VENTILATING

"Cooling Systems for Buildings." By A. M. Feldman. *American Architect,* Vol. CXXIV, July-December, 1923; p. 379.

"Heating and Power Cost Analysis for Office Buildings." *Heating and Ventilating Magazine,* January, 1923.

"Heating and Ventilating Equipment of the Cunard Building." By Henry C. Meyer, Jr. ARCHITECTURAL FORUM, July, 1921; pp. 22, 23.

"Heating and Ventilating of a Large Building." The John Hancock Building, Boston. By C. L. Hubbard. *Domestic Engineering.* July, 1923.

"Heating and Ventilation of Offices and Banking Rooms." By C. L. Hubbard. ARCHITECTURAL FORUM, December, 1914; pp. 307-310.

"Window Washing Problem." *American Architect,* Vol. CXX, July-December, 1921; p. 360.

INSURANCE

"The Moonshine Rate"—Discussion on Building Insurance. Nat'l Ass'n of Building Owners and Managers. 1923.

BIBLIOGRAPHY—Continued

OFFICE BUILDINGS—DESCRIPTION OF

Architects' Building, New York. By D. Everett Waid. ARCHITECTURAL FORUM, August, 1913; pp. 179-181.

Canada Cement Company Building, Montreal. Barott & Blackader, Architects. ARCHITECTURAL FORUM, January, 1923; pp. 17, 18.

Croisic Building, New York. Browne & Almiroty, Architects. ARCHITECTURAL FORUM, May, 1913; pp. 115-118.

Cunard Building. By Royal Cortissoz. ARCHITECTURAL FORUM, July, 1921; pp. 1-8.

Emmett Building, New York. J. Stewart Barney & Stockton B. Colt, Architects. ARCHITECTURAL FORUM, December, 1912; pp. 325-329.

Federal Life Building, Chicago. Marshall & Fox, Architects. ARCHITECTURAL FORUM, June, 1912; pp. 162-165.

Hartford Fire Insurance Building, Hartford. Edwin Sherrill Dodge, Architect; Parker, Thomas & Rice, Associated. ARCHITECTURAL FORUM, June, 1922; pp. 223-226.

Hartford *Times* Building, Hartford. Donn Barber, Architect. ARCHITECTURAL FORUM, April, 1920; pp. 141-144.

Hilliard Building, New York. Howells & Stokes, Architects. ARCHITECTURAL FORUM, February, 1912; pp. 39-42.

Insurance Exchange Building, Chicago. D. H. Burnham & Co., Architects. ARCHITECTURAL FORUM, April, 1912; pp. 106-109.

Los Angeles Trust & Savings Bank Bldg., Los Angeles. Parkinson & Bergstrom, Architects. ARCHITECTURAL FORUM, May, 1912; pp. 127-130.

McLachlen Building, Washington. J. H. DeSibour, Architect. ARCHITECTURAL FORUM, November, 1912; pp. 299-302.

North American Building, Chicago. Holabird & Roche, Architects. ARCHITECTURAL FORUM, January, 1913; pp. 21-24.

Office Buildings for Individual Occupancy. Douglas L. Elliman & Co., Inc., New York. Combustion Engineering Corporation, New York. Chicago Pneumatic Building, New York. ARCHITECTURAL FORUM, March, 1922; pp. 97-100.

Postal Life Building, New York. York & Sawyer, Architects. ARCHITECTURAL FORUM, November, 1916; pp. 172-174.

Union Trust Building, Winnipeg, Manitoba. John D. Atchison & Co., Architects. ARCHITECTURAL FORUM, November, 1913; pp. 259, 260.

Hide and Leather Building, New York. By R. C. Gautier. ARCHITECTURAL FORUM, March, 1922; pp. 101-104.

PLUMBING

"Plumbing in the Cunard Building." By Clyde R. Place. ARCHITECTURAL FORUM, July, 1921; p. 24.

"Plumbing Construction Detail in Modern Office Buildings." By J. K. Raymond. *Domestic Engineering*, May, 1922.

STORE REQUIREMENTS

"Chain Store Tenant List." Nat'l Ass'n Building Owners and Managers. 1923.

View of Completed Bush Terminal, London, from Kingsway

Helmle & Corbett, Architects

BOOK DEPARTMENT

Mohammedan Architecture and Ornament

STUDENTS of architecture and architectural history who look for a distinctly Mohammedan religious style will be disappointed; it would be as logical to search for a distinctly Christian type, for just as Christianity in its progress during centuries and in different countries developed many architectural styles, Islam influenced when it did not develop types which were different in northern Africa, India, Spain, Syria, and Egypt, the divergence in architecture resulting from differences in characteristics of the older civilizations upon which the newer culture was grafted or established.

Nevertheless, in the structures which Islam reared in various parts of the world there are to be found certain characteristics which symbolize a common religious faith, sufficient indeed to mark almost anywhere a building in which Mohammedan worship is conducted. Broadly speaking, Mohammedan architecture might be described as an adaptation of the Byzantine,—an Asiatic form of the late Roman style adapted to Christian uses. The oriental strain in its composition would naturally make it readily adaptable by Moslems when they came to face problems of design, and with the Turkish conquest of Syria and Egypt such buildings as the *Takiyyah* at Damascus were based on the model of certain churches at Constantinople. Among the details of Mohammedan architecture which may be attributed to a Byzantine origin are: certain forms of vaulting; arcades supported upon columns; dosserets; wooden tie-beams across arches; carved beams in carpentry; mosaic; marble linings and dados; bronze furniture and window fittings; windows of pierced or reticulated marble, and the use of alternating stripes of red and white, yellow or black in facades and sometimes in the voussoirs of arches.

Instead of a rich liturgical worship, such as was developed in the Christian Churches of East and West, Moslem worship is simplicity itself and offers but small opportunity for the employment of the splendid accessories which add so greatly to the interest of Christian churches. Worship consists chiefly of public prayer to which worshipers are summoned by the *muezzin* from the mosque's minaret, while within little is required beyond an area unobstructed and sufficiently large to accommodate a great body of worshipers, who kneel on the floor. Liturgical arrangements do not exist excepting a niche (*mihrab*) indicating the direction toward Mecca, the Holy City, and a pulpit (*mimbar*), which in some of the later mosques frequently resembles the *ambos* of certain old churches in Italy.

Courtyard of an Old House in Cairo
Illustration from "Mohammedan Architecture in Egypt and Palestine"

For the most part Mohammedan domestic building is of less importance than that of the mosques. The temperatures which prevail in most Mohammedan countries render it necessary that the houses be built with thick walls to exclude the heat, around courtyards, and with wooden lattices or carved grilles over the oriel windows, thus giving the interiors a certain grateful shade without entirely excluding the air. The plan of the house is today practically what it was centuries ago.

In this volume Mr. Briggs considers Mohammedan architecture as it has been developed in Egypt and Palestine, in both countries grafted upon an earlier architecture of which many characteristics persist. Even richer than its architecture is the Mohammedan use of craftsmanship in manifold forms. Reference has already been made to the carved wood screens or lattices which cover the windows of Mohammedan homes and form so striking a detail in the appearance of a street in a city or village of the East, and other ways in which carved wood is used are in doors, panels for many purposes, friezes, ceilings, and for inlays of different woods or of wood in connection with mother of pearl or other substances. Much use is made of metalwork of many sorts for countless purposes. Use of glass includes the enameling which is done upon mosque lamps and other objects as well as the use of colored glass for windows of a type strongly oriental, and different from that used in the West.

MOHAMMEDAN ARCHITECTURE IN EGYPT AND PALESTINE. By Martin S. Briggs, F.R.I.B.A. Author of "Baroque Architecture." 250 pp., 9 x 11 ins. Price $28. The Oxford University Press (American Branch), New York.

BUILDING CONSTRUCTION BOOKS

A GROUP OF RECENT PUBLICATIONS THAT PRESENT IN CONCISE FORM THE LATEST DATA ON CONSTRUCTION PROBLEMS; PREPARED BY AUTHORITATIVE ENGINEERS

Concrete Engineer's Handbook

By GEORGE A. HOOL
Professor of Structural Engineering, University of Wisconsin
and NATHAN C. JOHNSON
Consulting Engineer

In its more than 800 pages this book gives the entire data of practical concrete construction. It is a concise encyclopedia of modern plain and reinforced concrete practice—a working manual for the concrete engineer. It contains numerous tables and diagrams and much important information never before published in book form. A special chapter deals with estimating costs. It is an all-inclusive book that deserves the title, "The big book on concrete."

885 pages, 6 x 9, flexible binding, fully illustrated

Price $6

Concrete Designers' Manual

By GEORGE A. HOOL
Professor of Structural Engineering, University of Wisconsin
and CHARLES S. WHITNEY
Consulting Engineer

A valuable collection of tables and diagrams prepared by the authors in their practice for the design of reinforced concrete structures. They are in accordance with the Joint Committee regulations, the American Concrete Institute recommendations and the building code requirements of New York and Chicago. No attempt is made to develop theory; the text is limited to explanations of the tables, and where necessary specific examples of how to use them. A great time-saver for engineer or architect.

276 pages, 6 x 9, flexible binding, 66 diagrams, 54 tables

Price $4

HOOL AND JOHNSON'S

Handbook of Building Construction

GEORGE A. HOOL *and* NATHAN C. JOHNSON
Editors-in-Chief, assisted by 46 specialists

Nearly fifty specialists collaborated to produce this great two-volume handbook on modern building design and construction. The records, the experience, the methods of big engineering companies and leading construction engineers have been incorporated in it. It is a digest of the best approved practice of modern building construction.

It offers architects, construction engineers, contractors and builders a body of information on practical construction that has never before been even approximated. Principles, methods, costs, tables and reference data are all spread out before you in these two handy books for quick reference and constant use. A work without a parallel—a great achievement of technical authorship.

1474 pages, 6 x 9, flexible binding, fully illustrated

Two volumes (not sold separately)

Price $10 per set

Concrete Construction for Architects

By DeWITT CLINTON POND

This book, written by the author of "Engineering for Architects," has been prepared with the needs of architects especially in mind. It takes up the various stages of concrete design in concise chapters, beginning with an explanation of moments and reactions and shear and bending diagrams. The treatment of the subject is simplified by connection with definite problems, the solutions of which are indicated in detail.

204 pages, 6 x 9, cloth binding, fully illustrated

Price $4

Practical Structural Design

By ERNEST McCULLOUGH, C.E.

A practical textbook on the designing of structures, written in simple, non-technical language that enables the student to grasp the usual engineering problems involved in building with a minimum expenditure of time. It covers the essentials of the subject as related to wood and steel framing. Prepared by an engineer of wide experience in teaching.

317 pages, 5¾ x 8½ ins.

Price $3

These books or any selection of them will be promptly forwarded, carrying charges prepaid, upon receipt of price

ROGERS AND MANSON COMPANY
ARCHITECTURAL PUBLISHERS
383 MADISON AVE. NEW YORK

ESTIMATING BUILDING COSTS AND APPRAISING BUILDINGS. By Frank E. Barnes, 822 pp., 4½ x 7 ins. Price $5 net. McGraw-Hill Book Co., New York.

CONSTANT changes in costs of building materials and of the labor which enters into building construction, as well as the high costs of these commodities, place heavy responsibilities upon those in charge of the preparation of estimates. There are many instances on record where some apparently trivial error, some oversight seemingly small, has caused a heavy loss to a contractor whose bid was accepted,—possibly by reason of a low price resulting from the error in question. Just because of the constant changes in prices it is useless to govern one's estimates by what may have been the cost of a building a year or so ago or even a month or two before, and since estimates must always be prepared quickly there is of course every opportunity for the making of troublesome mistakes. Much the same is true when it comes to giving figures on "appraisals." The work of insurance adjusters, real estate dealers, etc., involves much estimating of the values of buildings of various kinds, and since there are frequently large interests involved, it is quite as important to be as accurate in giving estimates in appraisals as upon new work.

This volume, prepared by the Supervising Building Valuation Engineer, New York Central Lines, deals with the subject in a way which is calculated to help the building contractor, estimator or appraiser dealing with structures of different types. Its use will not, of course, render unnecessary the care which an estimator or appraiser should exercise, but it extends many helps by giving data in forms which are quickly and easily referred to. Tables give the actual present-day construction costs of numerous types of buildings built between 1890 and 1923, and show the percentages of increase in building costs for the entire period. A contractor often knows the actual cost of some structure which is similar to that for which he may be preparing a bid but which may have been built some years before when prices were quite different. It is easy, however, by using these tables, to make a comparison of the costs of the two projects.

The 29 chapter headings deal with every department of estimating, and they are so complete that by glancing over the sub-headings of the chapters the estimator would be almost certain to avoid making any important error.

A HISTORY OF ART. By H. B. Cotterill. Volume II. Later European Art, with Chapters on Oriental Sculpture and Painting. 461 pp. $10 net. Frederick A. Stokes Co., New York.

IN the second volume of this excellent work there are covered the middle of the Renaissance period and its later development in the countries of continental Europe, while the consideration of England, into which the Renaissance was late in penetrating, includes the period of transition from the Gothic into the Renaissance. In the earlier volume the subject matter was discussed according to eras, such as the Hellenic, Roman, Byzantine or Gothic, while in this volume each of the parts or chapters deals with a single country. As in Volume I, the author deals with architecture as well as painting and sculpture, and from his viewpoint the discussion of architecture has an interest which does not always attach to that of a writer whose work gives little consideration to other arts with which architecture is so intimately related. The treatment of the Renaissance in Spain is particularly good, especially the pages which discuss the Plateresque and the Rococo as made popular by Churriguera.

In the supplementary chapters devoted to the arts of the Far East, Mr. Stewart Dick, one of the official lecturers at the National Gallery, considers sculpture and painting as they were developed in India, China and Japan. These arts were influenced in their earlier stages by contact with the West, but they had during centuries of evolution an existence which was wholly independent, giving opportunity for following their own ideals, developing their own methods of technique, and building up their own body of traditions. A great part of Oriental art centers in Buddhism, which beginning in India traveled eastward into China, Korea and Japan. Few of the roads which the student of art history must travel are more difficult and devious than that which leads to an intelligent grasp upon the meaning of Eastern art, involving as it does foundation upon an abstruse religious symbolism which is unfamiliar and development by forms of technique which differ widely from those of Europe, besides being governed by canons of taste which are in themselves puzzling to Europeans or Americans. Oriental art involves considerable adherence to established conventions which persist through all the ages of painting and sculpture and which would seem to exclude all the wealth of development which these arts received at the hands of individual painters and sculptors in Europe. The art of the Far East like its civilization is reared upon a foundation different by far from that which supports art and civilization in the West, and those who would fully comprehend either have need of all the aid which writers and students extend. Study of Eastern art requires close application.

This volume, like Volume I, is lavishly illustrated with half-tones of buildings, paintings or works of sculpture which have been selected with excellent taste to illustrate and to add interest to the authors' text.

PICTURESQUE NEW ORLEANS. A Portfolio of Sketches by William P. Spratling, A. I. A. 7 x 10 ins. Price $1.25 net. The Penguin Bookshop, 407 Royal Street, New Orleans.

AMERICAN cities which possess real charm are not many, but New Orleans would undoubtedly be included in the number, others named probably being Baltimore, Boston and Montreal. Attention is sometimes drawn to the fact that American cities are rapidly being "standardized" to the point where they look alike, and as the march of progress continues and landmarks make way for skyscrapers of monotonous similarity any charm which a city may possess, particularly the charm of architectural character, is likely to disappear. This appears to be true of New Orleans, and one who knew the "Crescent City" in say the 70s or even the 80s of the last century would miss the stately St. Charles or the St. Louis Hotel which was also known as the "Hotel Royal," not to mention countless old buildings reminiscent of the French and Spanish periods in which New Orleans was once so passing rich.

But it seems that in at least one part of New Orleans the charm of other days lingers on, and in this little

portfolio are collected sketches of a number of such old treasures as still survive. The French Quarter of New Orleans—that *Vieux Carre* which once constituted the walled city of Nouvelle Orleans—is but ten short blocks in length, from Canal Street to Esplanade Avenue, and its width, from the river to Rampart Street, is but six scant squares. Once it was a French settlement, built of wood and consisting of small one-story houses set within gardens and screened from the narrow streets by high whitewashed picket fences. In 1788, only a few years after the town had passed from the French to the Spanish domination, it was destroyed by fire. Only a few houses escaped. When it was rebuilt, Spanish architects and builders played their part in its reconstruction. The city which rose from its ashes was of brick and plaster, with arches of heavy masonry. There were barred windows and long, dark corridors. Large, fanshaped windows looked down into courtyards which held banana trees, oleanders and parterres of flowers. Houses were built flush with the sidewalk, or *banquettes,* as they were called, and balconies of delicate wrought iron overhung the streets. Social and business life centered around the *Place d'Armes,* now called Jackson Square. It was in the square that the transfers of Louisiana from Spain to France and from France to the United States took place, and in the houses and streets nearby occurred the events which made the history of New Orleans so colorful, so bizarre and so charmingly unusual.

Even as we see it today, in its dying splendor, the *Vieux Carre* is the old Creole city of other days; it has a charm, a romance, a definite personality. Architects from distant cities come to New Orleans to study these old houses and to note the details of their construction, and each and every one of them finds something to interest him. One admires the wrought iron of the balconies, which cling to the mouldering walls like strips of old black lace; others study the oddly shaped windows, the heavy doors, or winding stairways.

Those who know the French Quarter will be interested in these sketches by William P. Spratling, instructor in architecture in Tulane University, for they are not only faithful records of out of the way places, but they have a decorative value of their own. Mr. Spratling understands the spirit of the old New Orleans, and he has expressed it in these pencil drawings.

THE AUTOBIOGRAPHY OF AN IDEA. By Louis H. Sullivan. Foreword by Claude Bragdon. 330 pp.; 5½ x 8 ins. Price $3. American Institute of Architects Press, New York.

THIS work is the publication in book form of the chapters by Mr. Sullivan which have already appeared in the *Journal of the American Institute of Architects.* The book might be called a volume of memoirs or reminiscences, and it presents in a permanent form their author's well known views on a number of subjects connected with architecture. Many architects will of course dissent *in toto* from Mr. Sullivan's teachings, while those who agree will presumably require no further strengthening of their faith.

Cottages, Farmhouses and Other Minor Buildings

In England of the 16th, 17th and 18th Centuries

By LOUIS CONRAD ROSENBERG

OF ALL the architectural types, that most appropriate for American domestic use is often thought to be that of the old English cottage or farmhouse. It can be easily developed in materials of almost every kind; it possesses wide flexibility as to scale, and the character of its fenestration provides the ample wall spaces which many designers highly value for their architectural effect. Its interior is readily developed to provide the rambling type of plan which is popular for country or suburban domestic buildings, and all in all, the English farmhouse or cottage answers every demand made by the modern home builder in the search for a practical type.

THIS important work presents half-tone illustrations from photographs or sketches of more than 100 English country houses of the cottage or farmhouse types, chiefly in the Cotswolds and in Sussex, Suffolk and Kent. It deals with the work of three centuries and illustrates buildings of several widely different kinds of old English domestic architecture, built of wood, plaster, stone, brick, or combinations of all these. There are also given countless detailed working drawings of doorways; oriel windows; gables; chimneys, singly or grouped in stacks; decorated plaster; half-timber work; fireplaces and cornices. A book invaluable to the architect.

102 pages, 10 x 13½ inches. Bound in cloth. Price $15.

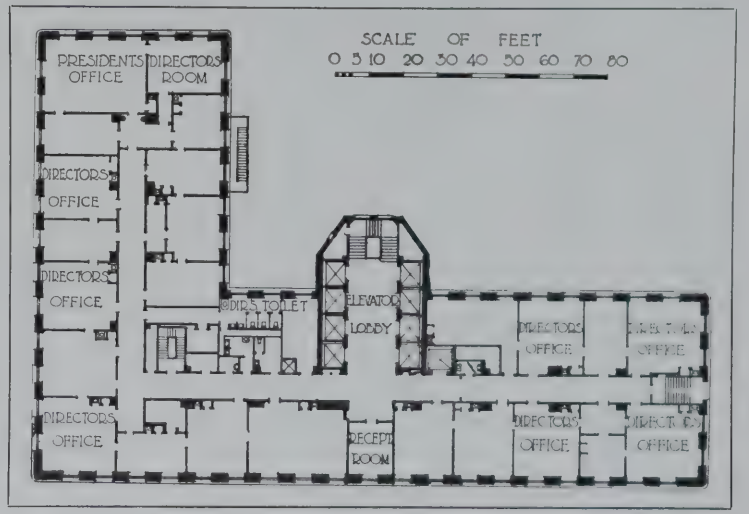
ROGERS & MANSON COMPANY - - 383 Madison Avenue, New York

REAR AND STREET VIEWS OF THE STANDARD OIL BUILDING, SAN FRANCISCO

GEORGE W. KELHAM, ARCHITECT

DETAIL OF CORBELED GALLERY USED TO CROWN THE MAIN FACADE

DETAIL OF TOP OF STAIR TOWER



TYPICAL FLOOR PLAN

STANDARD OIL BUILDING, SAN FRANCISCO

GEORGE W. KELHAM, ARCHITECT

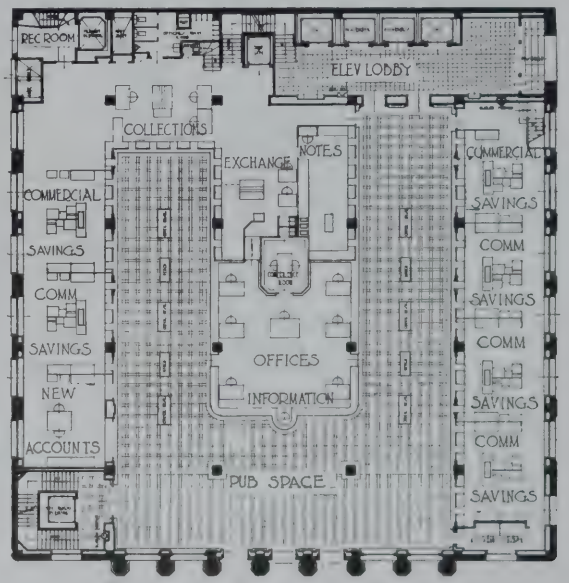
MAIN ENTRANCE TO THE BANK OF ITALY, LOS ANGELES
MORGAN, WALLS & CLEMENTS, ARCHITECTS

GENERAL VIEW OF THE BUILDING

In the Bank of Italy Building materials are granite for the first two stories, brick for the intermediate stories, and terra cotta for the upper stories. Construction: steel frame. Heating: vacuum steam. Electric service: typical of office buildings of this class. Type of elevators: 1 to 1 multi-voltage, electric. Windows: steel and wood. Finish of corridor walls and floors: 5-foot marble wainscot and marble floor. Cost per cubic foot: 60 cents. Cost of banking offices on first floor not included.

The plan is shaped like the letter U, with a court in the center, above the banking floor, which lights the bank, and all the inside offices on the ten floors above. As the bank occupies the entire first floor of the building, the entrance and lobby, where the elevators connect with the floors above, are located at the rear corner of the building, back of the bank. Finely executed Renaissance ornament marks the building's detail, adding to its dignity.

PLAN OF TYPICAL OFFICE FLOOR



PLAN OF BANKING ROOM

BANK OF ITALY BUILDING, LOS ANGELES
MORGAN, WALLS & CLEMENTS, ARCHITECTS

VIEW OF BANKING ROOM

PUBLIC ELEVATOR LOBBY ON ENTRANCE FLOOR

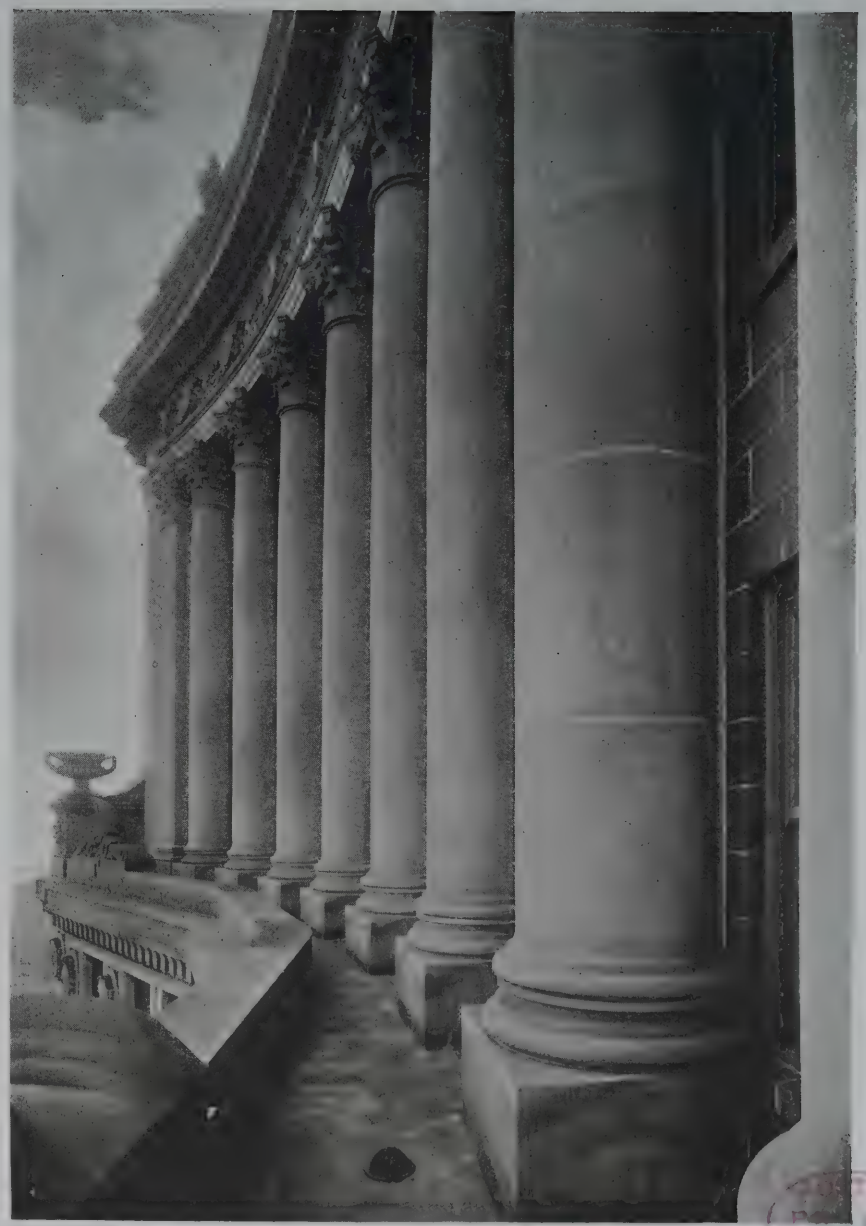
BANK OF ITALY BUILDING, LOS ANGELES

MORGAN, WALLS & CLEMENTS, ARCHITECTS

LONDON GUARANTEE & ACCIDENT BUILDING, CHICAGO

A. S. ALSCHULER, ARCHITECT

DETAIL OF THE MAIN ENTRANCE



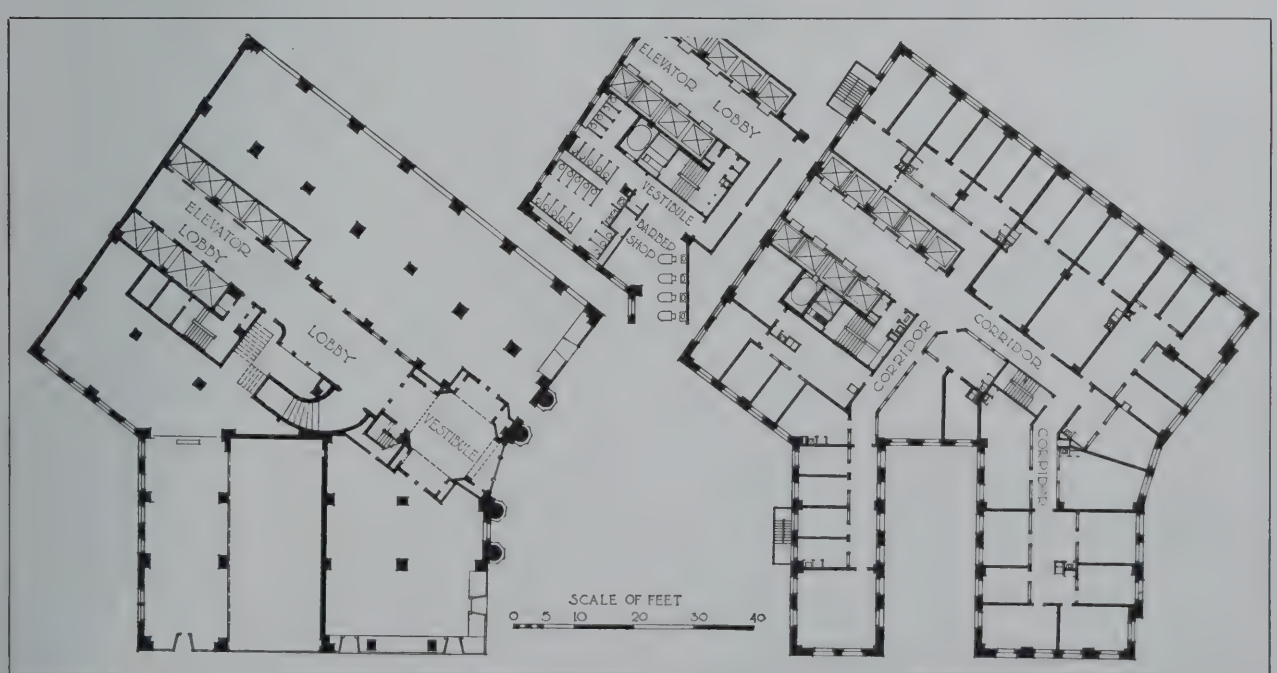
DETAIL OF THE UPPER COLONNADE

LONDON GUARANTEE & ACCIDENT BUILDING, CHICAGO

A. S. ALSCHULER, ARCHITECT

DETAIL OF ELEVATOR LOBBY

Exterior material of the London Guarantee Building is Indiana limestone. Construction: steel frame, with tile arch floors. Heating: vacuum system with thermostatic control. Elevators: micro-leveling, multi-voltage. Finish: mahogany. Windows except on bank floor: wood, double-hung. Walls of entrance lobby, travertine; floor of marble. A feature of the plan is the curvilinear treatment of the upper stories produced by the setback of the Plaza front to balance the wings of unequal widths.



PLAN OF GROUND FLOOR PLAN OF TYPICAL OFFICE FLOOR

PLAN OF TOILETS ON ALTERNATING FLOORS

LONDON GUARANTEE & ACCIDENT BUILDING, CHICAGO

A. S. ALSCHULER, ARCHITECT

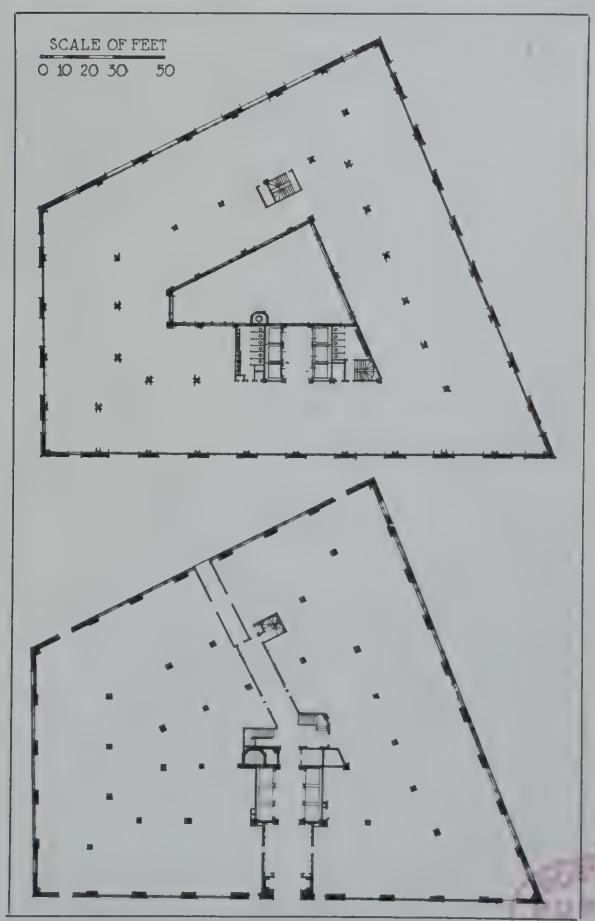
Photos, Paul J. Weber

CUSTOM HOUSE PORTICO AND BOSTON INSURANCE EXCHANGE

Of the Boston Insurance Exchange the exterior material is limestone, with window spandrels of iron and copper. Construction: steel frame. Floors: long-span terra cotta tile, with concrete joists. Heating: direct steam. Electric service: 110-220 volts, d.c. Elevators: single-gear traction, bronze finish. Windows: wood sash. Finish of corridor walls and floors: marble on first floor, elsewhere plaster walls, with marble base and rubber tile floor. The building covers an entire block, irregular in shape. Decorations were carried out simply in the Greek style, to harmonize with the Doric architecture of the remodeled Boston Custom House opposite on Central Street.

BOSTON INSURANCE EXCHANGE, BOSTON

COOLIDGE & SHATTUCK, ARCHITECTS



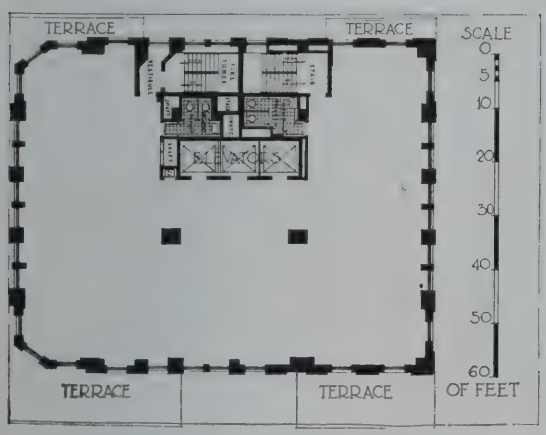
ELEVATION OF MAIN FACADE

GROUND FLOOR AND TYPICAL PLAN

BOSTON INSURANCE EXCHANGE, BOSTON

COOLIDGE & SHATTUCK, ARCHITECTS

VIEW FROM BRYANT PARK



TYPICAL FLOOR PLAN

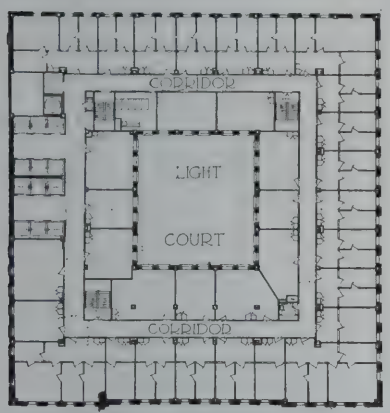
GROUND FLOOR PLAN

PERSPECTIVE SKETCH BY BIRCH BURDETTE LONG

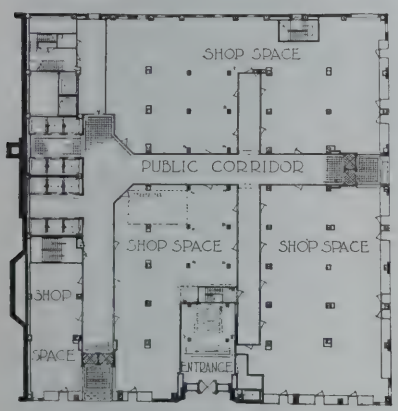
AMERICAN RADIATOR CO. BUILDING, NEW YORK

RAYMOND M. HOOD, ARCHITECT

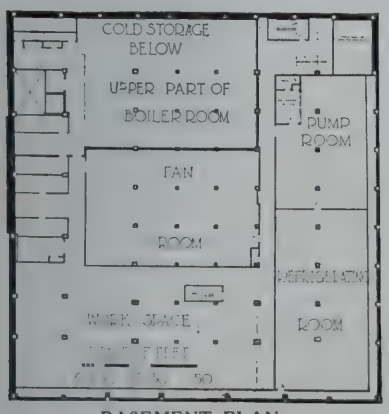
The exterior material of the Straus Building is Indiana limestone. Steel frame construction. Tile arch floors. Two-pipe vacuum heating system, up-feed type. Electric service: three-wire, 110-220-volt, direct current; 30-volt low tension to all tenants for buzzers, clocks, etc. Metal windows. Corridor floors: marble tile 9 x 18 inches. Walls: Tinos green marble. Wainscot: cream marble.



TYPICAL FLOOR PLAN



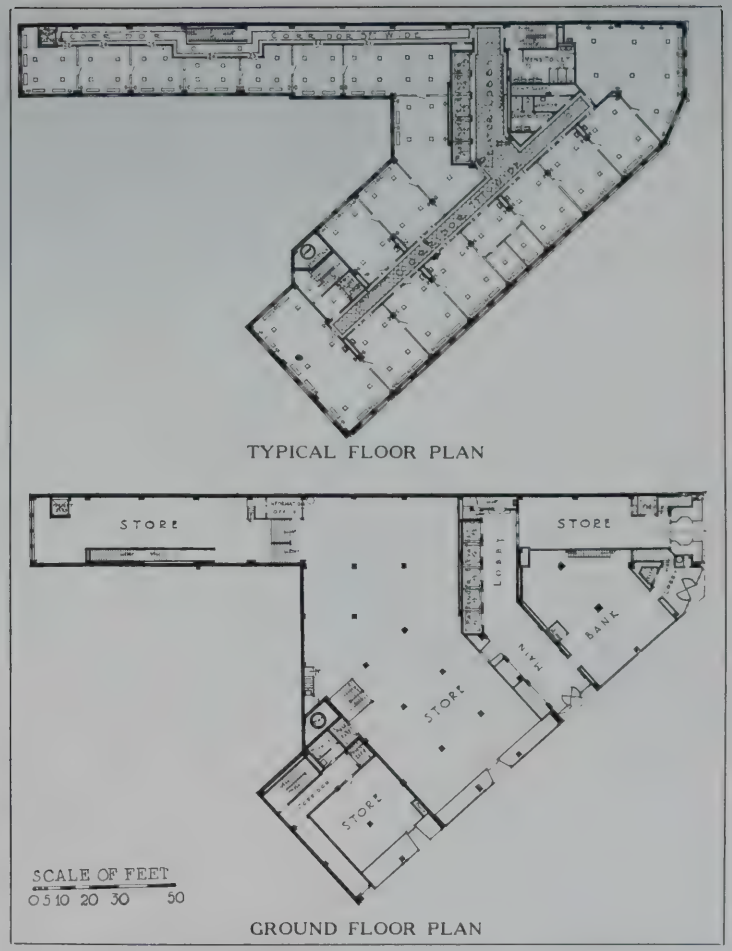
GROUND FLOOR PLAN



BASEMENT PLAN

THE S. W. STRAUS & CO. BUILDING, CHICAGO
GRAHAM, ANDERSON, PROBST & WHITE, ARCHITECTS

LIBRARY



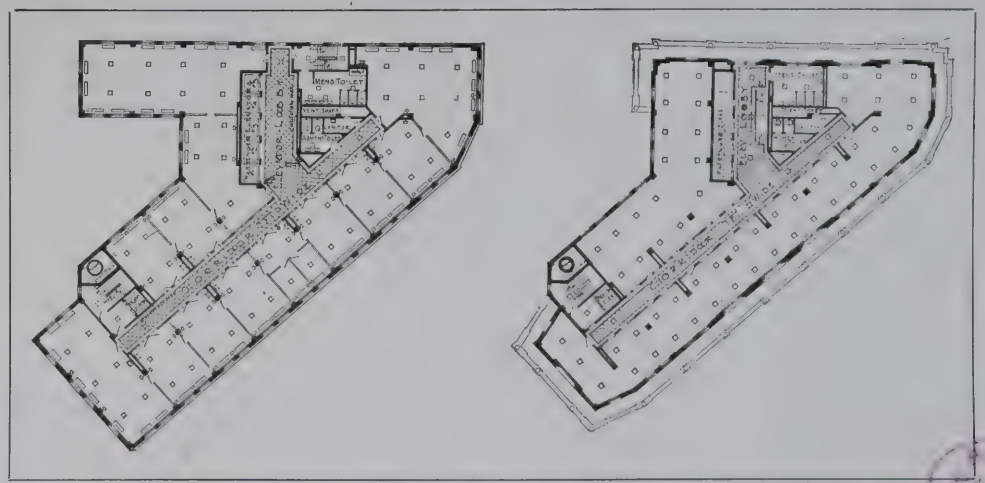
Of the Genesee Building the exterior materials are cast iron show fronts for two lower stories; brick and terra cotta, upper stories. Construction: steel frame, concrete slab floors. Steam heating. Electric service: 110-220-volt, with transformers, 110 d.c. breakdown. High speed electric elevators, bronze finish. Double-hung steel windows. Corridor walls: plaster with 4-foot gray marble wainscot. Floors: gray marble, green marble base. Cost per cubic foot, 34 cents for general construction only, excluding fees.

THE GENESEE BUILDING, BUFFALO, NEW YORK

EDWARD B. GREEN & SONS, INC., ARCHITECTS; MERRELL CLEMENT, ASSOCIATED

VIEW FROM MAIN STREET

ENTRANCE FOYER

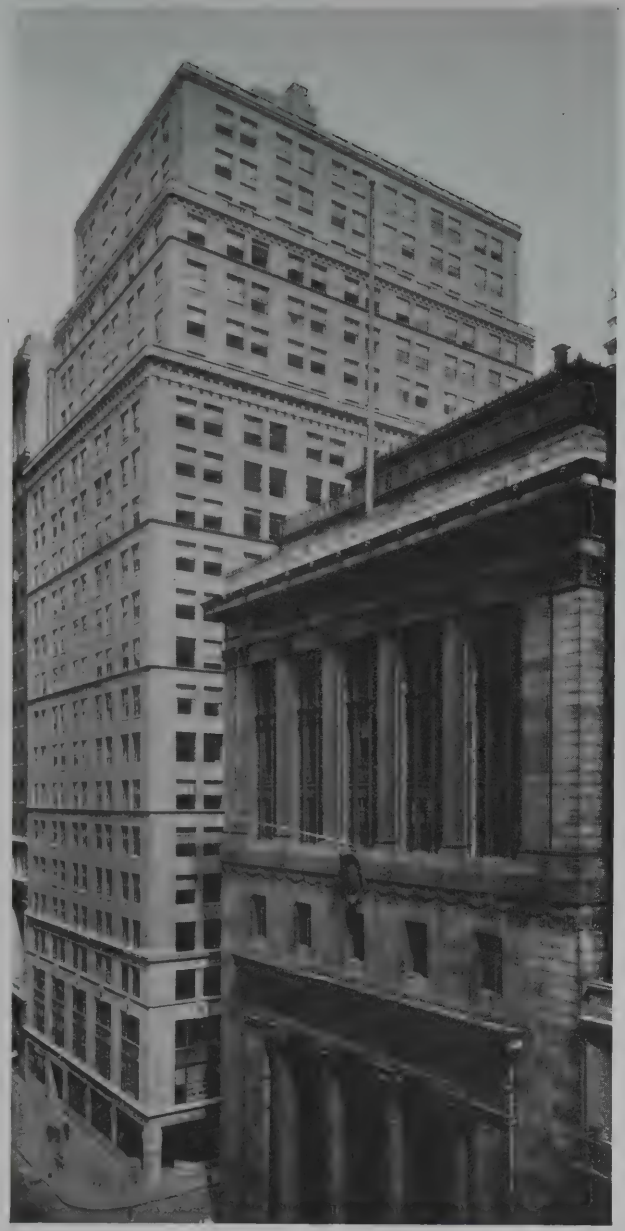


PLAN OF EIGHTH AND NINTH FLOORS

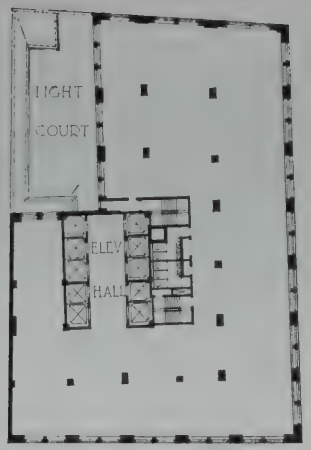
THIRTEENTH FLOOR PLAN

THE GENESEE BUILDING, BUFFALO, NEW YORK

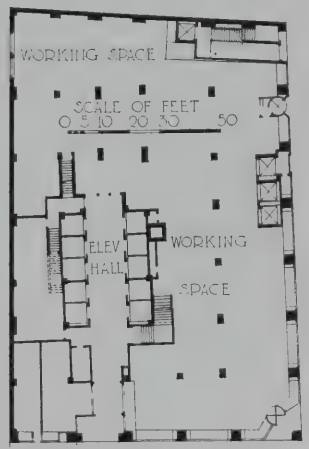
EDWARD B. GREEN & SONS, INC., ARCHITECTS; MERRELL CLEMENT, ASSOCIATED



VIEW LOOKING UP BROADWAY



TYPICAL FLOOR PLAN



GROUND FLOOR PLAN

Of the Westinghouse Building the walls are limestone and brick; cast iron decorations. Construction: steel frame; reinforced concrete floors. Heat and electricity furnished from public service stations.

DETAIL OF THE LOWER STORIES

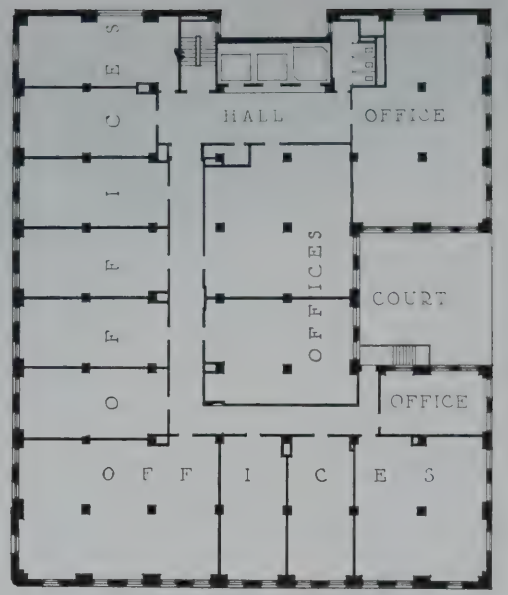
TWO VIEWS OF THE WESTINGHOUSE BUILDING, NEW YORK

STARRETT & VAN VLECK, ARCHITECTS

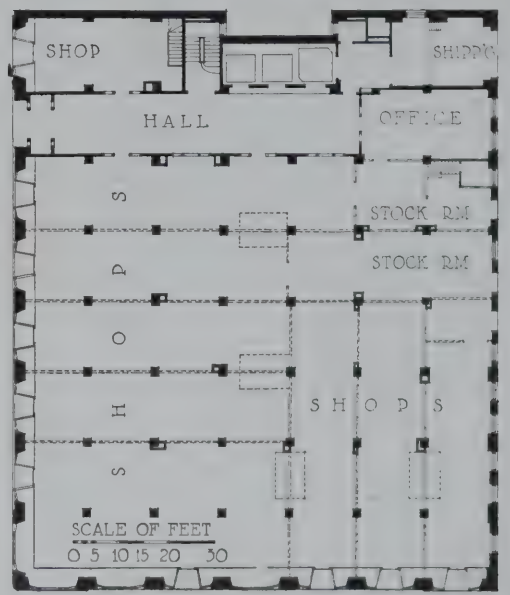
GENERAL EXTERIOR VIEW

Exterior material of the Keefer Building is Indiana limestone for the two lower stories, light gray brick above. Floor construction: reinforced concrete. Open return low-pressure steam gravity system for heating. Electric service: 110-220 volts, three-wire for lighting; 550 three-phase a.c. for power. Elevators: two-speed a.c. type, 385 feet per minute. Cabs are metal, painted. Windows: double-hung metal frame and sash. In entrance hall and elevator lobby, floors are terrazzo, with black marble borders. Office corridor floors, linoleum field with terrazzo borders. Cost per cubic foot, including stores and costs, was 37.4 cents. Building was begun in 1923.

Ten stories in height, this building shows a careful study of horizontal and vertical lines. Strongly defined piers strengthen the corners. The character of the design recalls some of the Italian Renaissance work of McKim, Mead & White, such as the Gorham Building, New York.



TYPICAL FLOOR PLAN



GROUND FLOOR PLAN

KEEFER BUILDING, MONTREAL
ROSS & MACDONALD, ARCHITECTS

THE ARCHITECTURAL FORUM

OCTOBER

1924

QVALITY LEAVES ITS IMPRINT

Making Floor Space Do Double Duty

Large assembly and banquet rooms are necessary in hotels, churches, schools, Y. M. C. A.'s and other public buildings. But unless used frequently, they become a liability rather than an asset. In these days of high land values, it is far wiser to build so that several small rooms may be thrown into one whenever the need for large space arises.

R-W Folding Partition Door Hardware

makes it a simple matter to convert any number of small rooms into one at a moment's notice. The doors fold compactly to either side, leaving a clear, unobstructed opening the full width of the room.

Doors hung on *R-W Partition Door Hardware* are securely supported at both top and bottom, making sagging, sticking and rattling impossible. Because they slide and fold in pairs, they are so easy to operate that a child can open or close them. Write to Dept. F for further information regarding this space-saving innovation.

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(826)

BOSTON PUBLIC LIBRARY

Photo. Paul J. Weber

TEMPLE OF CASTOR AND POLLUX, ROME

GREAT STYLES OF INTERIOR ARCHITECTURE. By Roger Gilman, Dean of the Rhode Island School of Design. 264 pp.; 126 plates; 6 x 9 ins. Price $7.50. Harper & Brothers.

IT might be thought that the publication during a brief period of time of so many works dealing with interior decoration would result in glutting the market created by interest in the subject. Even a casual examination of this recent work, however, proves that while it handles what is necessarily the same subject matter, it treats the topic in a new way in that instead of approaching it from the historical standpoint, relating the progress of the periods of interior architecture and decoration to the reigns of various monarchs or the rule of different dynasties, it follows what might be called the evolution of ideas,—the stages of progress from the time of the mediæval period in Italy until that in England when after the end of the eighteenth century the wane of the vogue of the Adam style led to chaos and loss of popular interest in the subject excepting such as was manifested in the various "revivals" which came after.

Perhaps it would be impossible when writing upon a topic already so abundantly covered to present anything of paramount interest which is fresh and unknown, but Mr. Gilman arranges in a guise new and attractive matter already well known even though not always fully understood, and it is useful to a student to have pointed out the various paths or roads which lead to the same ends. We particularly admire the way in which the author recognizes what we ourselves are likely to call the "Stuart" period. Most writers apply the term "Jacobean" to the entire period during which England was ruled by the house of Stuart, but we are apt to use "Jacobean" as defining the reign of James I, and the term "Stuart" what followed the Commonwealth, ending with the reign of Queen Anne who as daughter of James II belonged to the Stuart family.

Several pages of excellent bibliography are included, and one detail which is so good that it might well be widely copied is the arrangement of the illustrations. Instead of being scattered through the text, where they merely perplex and annoy the reader, they are grouped at the end of the volume and in such order that the reader can easily and quickly refer to them.

MODERN ENGLISH ARCHITECTURE. By Charles Marriott. 268 pp.; 6 x 9 ins. Price $7.50. Charles Scribner's Sons.

THERE is a particular interest in our observation of the development of architecture and building in England, possibly the interest which attends watching the solution of problems which are similar in many respects to those which engage the attention of architects and builders in America. The English architectural publications show occasionally work which is not exactly what we expect the English to produce, but these examples are exceptions to the rule which shows adherence to a standard which is generally high.

The English are fortunate, of course, in having a definite and consistent architectural tradition. For more than four centuries there has been passing a succession of stately architectural types, each reaching its culmination before giving way to, or rather being merged with, the style next to follow, and these centuries have left in the old civilization of England enough of the slowly accumulated results of building to influence present and future work. Then too, the character of the population of England was fixed centuries ago and has never been changed. Since the Conquest there has been no great movement which could change the race, and as generation has followed generation the character of the English has become more definite, all this being as different as possible from what prevails in a land possessed of comparatively little in the way of architectural tradition and inhabited by people recently come from every country under heaven and guided by nothing definite or stable in the way of tradition of any sort.

In this volume there is presented a layman's survey of building in England during a period covering roughly the last one or two decades, useful as affording a cross-section of what is being done. The volume is to some extent in the form of an essay and to some extent historical, giving the author's views of the theory of architecture and its history, besides reviewing the work which is selected for special mention,—work in such widely separated fields as the designing of churches, public buildings of different kinds, schools, residences urban and rural, and many other types including the "industrial villages" or "housing groups" which the English handle so successfully.

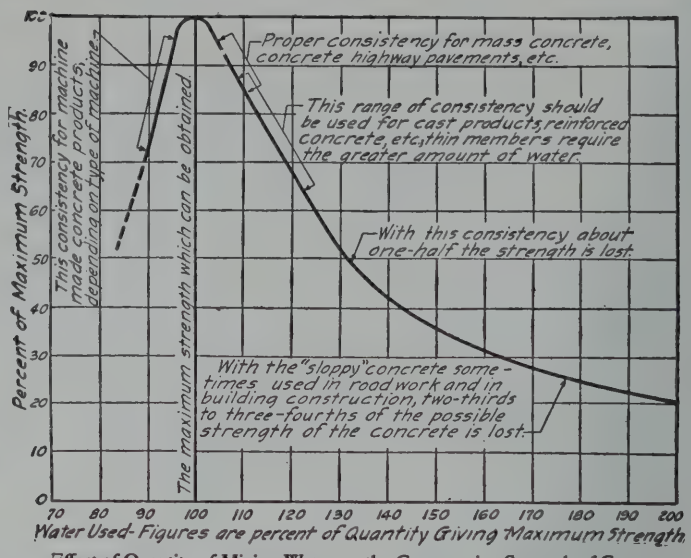
An examination of the illustrations in the volume shows a strong adherence on the part of English architects to the English Renaissance,—their use of forms being not precisely that of any of the types generally included in the term but made up of much the same motifs and expressing the same straightforward dignity and clothed with the grace which has for centuries characterized English building.

CATHEDRAL CHURCHES OF ENGLAND. By Helen Marshall Pratt. 583 pp., 5 x 7¼ ins. Price $4. Duffield & Co.

IN the vast literature which for many years has been growing up around the cathedrals of England, they are discussed from the points of view of the historian, the antiquarian and the architect. Most of these cathedrals are the result of building which extended over centuries, each generation of builders working in the architectural style which was in favor at the time, some indeed having parts built in many or all of the styles which were in vogue in England from the Saxon to the Perpendicular Gothic with which the Gothic age and the great church building period in England simultaneously came to an end. St. Paul's alone of all the English cathedrals is built entirely in the Renaissance style, though certain others show Renaissance detail or influence in such accessories as altars or tombs to which considerable architectural character is likely to be given.

Miss Pratt's study of each of some 33 cathedrals does justice to its historical and architectural importance. In many instances these old buildings were reared as monastic churches and became the seats of bishoprics only when the monastic orders were suppressed during the sixteenth century, and enough of each building's history is given to explain its architecture and ornament. The volume contains a valuable review of the ecclesiastical architectural styles and a particularly helpful glossary.

When One Pint of Water Wastes Two Pounds of Cement



Effect of Quantity of Mixing Water on the Compressive Strength of Concrete
NOTE: In general construction, the maximum strength can rarely be obtained, but it is possible to obtain 70 to 90 per cent of the maximum strength without additional expense by restricting the quantity of mixing water.

Observe this curve closely. It shows impressively the effect of the quantity of mixing water on the strength of concrete.

It is now known that excess mixing water, not only weakens concrete, but that it is actually wasteful of cement. One pint of water more than necessary in a one-bag batch decreases the strength and resistance to wear as much as though two or three pounds of cement were left out.

Here is a fact, which if brought home to the superintendent and the foreman, can be of great practical value in raising quality on the job.

Wouldn't you like to have, right at hand for quick reference, a practical manual which tells how the quantity of mixing water can be closely controlled, so as to give concrete greater strength without using any more cement?

Then write today for our free booklet, "Concrete Data for Engineers and Architects." We will be glad to send you extra copies for superintendents and foremen.

Take full advantage of the service the Portland Cement Association has to offer. One of the District Offices of the Association is always near you. Get acquainted with it.

ONE HUNDRED YEARS 1824 1924 OF PORTLAND CEMENT

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

Atlanta	Denver	Los Angeles	New York	Salt Lake City
Birmingham	Des Moines	Memphis	Oklahoma City	San Francisco
Boston	Detroit	Milwaukee	Parkersburg	Seattle
Charlotte, N. C.	Indianapolis	Minneapolis	Philadelphia	St. Louis
Chicago	Jacksonville	New Orleans	Pittsburgh	Vancouver, B. C.
Dallas	Kansas City		Portland, Oreg.	Washington, D. C.

Our Booklets are sent free only in the United States, Canada and Cuba

THE EDITOR'S FORUM

PROGRESS OF ZONING

APPROXIMATELY 24,000,000 people, living in 261 municipalities throughout the United States, are enjoying the benefits of zoning, according to statistics compiled by the Division of Building and Housing of the Department of Commerce. The greatest zoning center is in the territory in New York State and northern New Jersey, having New York for its hub; other centers are in California, Ohio, Massachusetts, Illinois and Wisconsin.

Secretary Hoover, in a recent statement, characterized properly drawn zoning ordinances as "reasonable, neighborly agreements as to the use of land." They divide a city into districts in which are limited the use to which land and structures may be put; the height and number of stories of the buildings; and the areas of the lots to be occupied by the buildings. Their professed object is to regulate the use of private real estate for the purpose of promoting health, safety, morals and the general welfare of the entire community.

That the idea has made a strong appeal to the American people is shown by the rapid spread of zoning. On January 1, 1923, there were only 129 zoned cities, towns and villages. The first comprehensive effort to zone was the passage of a zoning ordinance by New York in 1916, although Los Angeles passed a "Use" ordinance in 1909, and Boston regulated the height of buildings in 1904. Cities, towns and boroughs throughout the country generally are showing more than a passing interest in zoning. Where authority is granted, various municipalities are actively engaged in the solution of their zoning problems with enthusiastic zoning commissions and auxiliary committees at work. Even where state legislation does not authorize zoning, various public spirited and progressive organizations are studying local situations so that when zoning can be effected legally, much of the preliminary work will be finished and much valuable time thus saved.

New Jersey leads in the number of zoned municipalities, having 66; New York has 41; California has 33; Illinois, 25; Massachusetts, 24; Ohio, 16; Wisconsin, 13; Indiana, 5; Michigan and Missouri, 4 each; Iowa and Rhode Island, 3 each; Florida, Michigan, Oklahoma, Pennsylvania, Virginia and Washington, 2 each; and Arkansas, Colorado, Connecticut, Georgia, Maryland, Nebraska, North Carolina, North Dakota, South Carolina, Tennessee, Utah and the District of Columbia, 1 each. The complete list of zoned municipalities can be secured from the headquarters of the Division of Building and Housing, Department of Commerce, Washington.

THE 17th PARIS PRIZE

THE Committee on Paris Prize of the Society of Beaux Arts Architects announces the result of the final competition for the 17th Paris Prize, the donor of which is The Paris Prize Committee, Inc. The Jury of Awards included William A. Delano, Raymond M. Hood, Benjamin W. Morris, E. S. Hewitt, E. F. Sanford, Jr., W. M. Kendall, Guy Lowell, H. V. B. Magonigle, D. Everett Waid, Arthur Loomis Harmon, R. H. Pearce, and H. O. Milliken, Chairman.

The awards were:

Placed first, with 1st medal:
Harry K. Bieg,
Edmund S. Campbell, Patron,
Armour Institute of Technology, and Chicago Atelier.

Placed second, with 2nd medal:
Samuel R. Moore,
Columbia University, and Atelier Hirons, New York.

Placed third, with 2nd medal:
Percival Goodman,
Atelier Licht, New York.

Placed fourth, with 2nd medal:
Elmer L. Babitsky,
Atelier Wynkoop-Seymour, New York.

Hors concours:
Andrew F. Euston,
Atelier Hirons, New York.

NECROLOGY

THE death recently of Frederick Walter Ives meant the passing of one identified with engineering and architecture in the different capacities of preceptor, writer, and practitioner. Coming to the Ohio State University in 1909 as an instructor in engineering drawing, he became in 1914 Assistant Professor of Agricultural Engineering in charge of farm structures, and a few years later he was made head of his department.

In addition to the work of his important position as teacher, Mr. Ives carried on in Columbus an independent practice as engineer, specializing in work involving agricultural engineering. He found time, too, for much valuable work as writer or editor, being author of a number of volumes which are being widely used as textbooks in schools. At different times he was a member of the editorial staffs of various publications, while at the time of his death he was a member of THE FORUM'S Consultation Committee, his interest being in problems having to do with different phases of agricultural engineering, in which he attained conspicuous success.

Why take a Week To do a One Night Job?

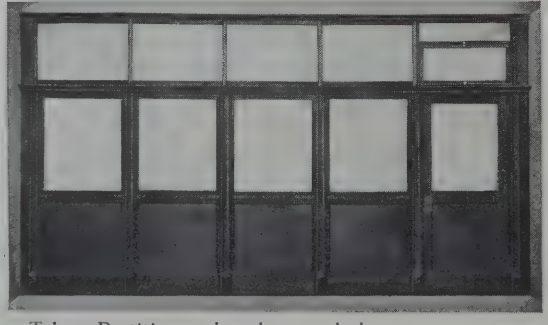
TELESCO Partition can be removed again and again with no expense but a few hours of carpenter's time.

Plaster partition is a total loss when moved. The resulting dirt and confusion cannot be figured in money. Even ordinary nailed-together wood partition must be ripped and damaged when a new layout is wanted.

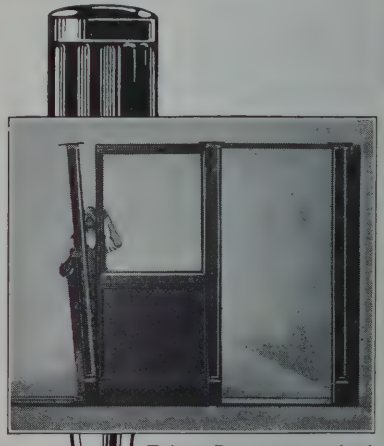
Why subject tenants or clients to this expense and inconvenience when it can be so easily avoided?

Telesco Partition is erected entirely with screws. It can be taken down and assembled again with ease. And most important of all, because of the extension top, it can be made to fit under any height ceiling without alteration.

Write today for catalog and full particulars.



Telesco Partition ready to be moved whenever necessary.



Telesco Partition standard units and posts slip easily into position.

A few screws hold them securely in place. Extension top fits to any ceiling height.

IMPROVED OFFICE PARTITION CO. 25 GRAND ST. ELMHURST, NEW YORK, N.Y.

The ARCHITECTURAL FORUM

VOLUME XLI OCTOBER 1924 NUMBER 4

The Alterations at Underhill Farm

RICHARDSON, BAROTT & RICHARDSON, Architects

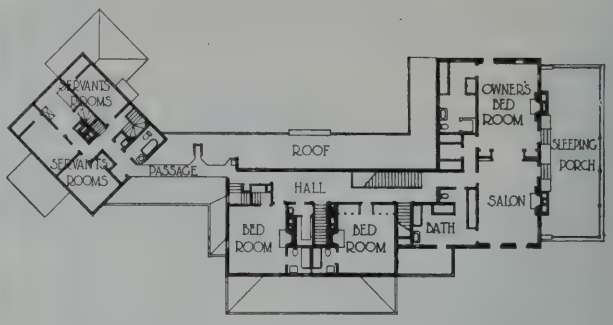
OFTEN the alteration is the most unique and interesting of the problems presented to the architect. Its happy and satisfying solution calls for a close and sympathetic relation between him and the client. Sentiment, on the part of the owner, for the old building demands the handling of the changes to the old house with an idea of the preservation of its character and the incorporation of it with the new without destroying its identity. To these requirements there is added, on the part of the architect, the merging of the old with the new, both in arrangement and design, to create a compact and homogeneous plan, meeting all the needs of the owner's household, and creating a unified and dignified design, expressing the plan and also the personality of the client. Such, then, is the general problem. The details, of course, vary. Usually more unique interiors as well as exteriors are possible in alterations than in new work, because a great many problems are presented in the changing of the old to create the new which would not be presented if the work were an entirely original conception. The solution of these problems sometimes creates unusual pictures of beauty and points of interest which would appear forced if striven for in the execution of a new design.

This is well illustrated in the house of Myron C. Taylor, especially in its plans and the design of its interiors. The original house on Mr. Taylor's estate, "Underhill Farm," was set near the main road, and consisted of an oblong building with a center hall. The frame of the house was old, dating back probably to the early eighteenth century, if not earlier. The exterior and part of the interior had been changed at later dates, probably more than once. The exterior at the time of the alterations contained much architectural work added during the later nineteenth century. Stripped of extraneous detail, the facades as left with their old handsplit shingles of wide exposure, simple moulded trim of the windows, and overhanging roof at the eaves and gables, were used as a basis of design of the new work, and dictated the character of the new cornices, dormers, porches and doorways of the recent additions.

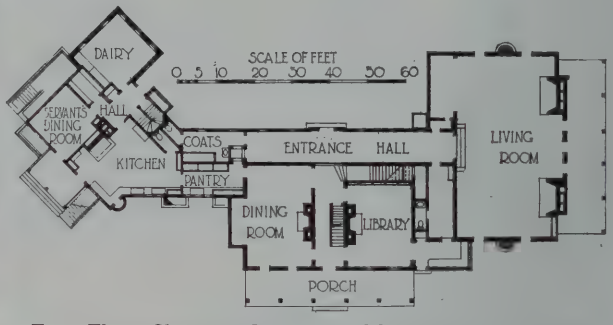
With the alterations and the need of additions to the old house, it was decided to place the existing building in a new location. From its position near the road it was moved farther into the estate to the top of a knoll. The garage had already been built, and the well and pump had been placed in relation to this new location. The house was set with the front and entrance side facing north, and the rear and garden side toward a stretch of land to the south suitable for the garden. This brought the east side toward wide lawns, gradually descending to a pond below, which emptied into the Sound. On this side were placed a large porch and a living room, with the owner's suite above. At the other end, to the west, near the entrances from the main road, the service wing was located in a separate house of its own, connected with the main house by a one-story wing which forms the pantry. The plan of the Taylor house was influenced by the desire on the part of the owner to keep intact the house which had been on "Underhill Farm" for generations, and to add to it and change it only as far as was necessary to meet the requirements of a modern country home. With the making of the new exteriors, as already said, it was possible in them to express the plan and to retain the Colonial character of the original house. However, in order to make of it a modern country house, it was necessary to preclude the adoption of the character of the architecture of the old rooms for the new interiors, except in two of the bedrooms of the old house.

The addition of a new living room wing, and a service wing as a separate house, one on either side of the old building, immediately presented the problem of the utilization of the rooms of the old house and the linking of the whole building by hallways. Besides this problem of plan was the consideration of levels, as the land dropped away from the old house toward the living room wing, and it was natural to place the floor of this addition lower than the floor of the old house. As a solution of this difference in levels, a connection between the new and the

Antique Spanish Gates at Entrance to Living Room



The Original House Is Easily Distinguished in the Center of the Second Floor Plan



First Floor Showing Service and Living Room Wings

Photos. John Wallace Gillies

The Library Is Designed in The Tudor Style

old work, an addition of one story was placed across the entire length of the front of the old house. This is the entrance hall, at one end opening into the living room through wrought iron gates, and at the other end opening into the service portion and men's coat room. On the side of this hall was the logical place to have the stairway to the second floor hall, which also extended along the front, connecting the service wing and the main house. The central hall of the old house, therefore, was at right angles to the new entrance hall and at a higher level. To connect the two, the front wall of the old house was removed and a large column placed for support. To preserve the vista through the old hall, the doorway of the house was placed on axis, allowing a view directly through to the door at the end of the old hall, and to the gardens beyond. The difference in levels between the two halls was taken care of by steps. To have made steps from the old hall directly into the new would have produced too formal an entrance to the rooms of the old house and emphasized the wrong axis on which the plan was based. Therefore, a wrought iron railing was placed between the halls, designed to allow the view through it, and the steps down to the entrance hall were placed at

Antique Linen Fold Paneling Used as Door from Library to Flower Room

There Is an Italian Gothic Feeling to The Large Living Room

one side, opposite the dining room door and leading on to the landing of the main stairway, incorporating the two. The stairway of the old hall was retained, but redesigned and made to enter a new second floor hall.

The old house, which was then connected with the service wing, was divided into single rooms either side of the old hall. On one side was the dining room and on the other the library. Off the library was added a flower room and between the library and the new living room a women's coat room. On the other side of the old hall, beyond the dining room, was a butler's pantry, connecting with the service wing, which contains the kitchen, pantries and servants' dining room. Other service rooms are in the basement, and the bedrooms are on the second and third floors of this wing. A small passage under the low roof of the connecting wing allows communication between the bedrooms of the service wing and the service rooms on the third floor of the main house, and the master rooms of the main house.

The plans of the second and third floors called for guest rooms and the owner's suite, together with connecting baths and closets. The two bedrooms of the old house open into the new hall. One bedroom, which had one end paneled in eighteenth century Colonial fashion, was kept as originally designed, except for necessary additions and restorations. The other bedroom was carried out in the style of the same period. From the side of the second floor hall a stairway leads to the third floor of the main house. At one end of the hall is the entrance to the passage to the service wing and stairs to the third floor, which contains other servants' bedrooms, sitting room, and pressing room. The other end of the hall opens into the hall of the owner's suite, which contains boudoir, bedroom, dressing rooms and baths.

The interiors reflect the style and character of the modern country house. Interior architecture is more vigorous and bold than that of the exterior. The richness and dignity of the design as well as the plaster walls give the halls and living room the appearance of being carried out in the Italian style, although in reality a great deal of the detail is not Italian. The library and dining rooms are paneled rooms, and the second floor rooms, as well as those on the third floor, are Colonial in style, but not of the same period.

The living room derives great attractiveness not only from its size and proportions but also from its unusual features. It is entered from the hall through a pair of antique iron Spanish gates of very interesting design, based on the grape vine pattern. Steps of solid oak lead down to the level of the room. Directly opposite this entrance, in a large recess made between the two fireplaces, are three casement windows which open onto the east porch, and allow a vista down the smooth and grassy slope of lawn to the pond beyond. At the left of the entering doorway, opposite one of the fireplaces, is a huge carved wood screen extending from floor to ceiling, which conceals the organ pipes behind it. This beautiful organ is responsible for two other features; a carved wood panel high up in the wall at the side of one of the fireplaces forms the echo-organ opening, and a small carved stone panel, an original from

Entrance Front, House of Myron C. Taylor, Esq., Underhill Farm, Locust Valley, N. Y.

a Spanish cathedral, placed in the wall, is used as a door to the Duo-Art mechanism. The ceiling has heavy moulded oak beams with rough plaster panels between. The walls also are rough plaster with the hand-troweled, uneven surface found in Italian work. This has been treated and rubbed to give it the mellow, warm gray ochre color of old plaster, which makes an effective background for the furnishings and a harmonious contrast to the woodwork. This woodwork, which is all hand worked and cut from solid pieces of oak, is stained and finished dark. The oak lintels of the fireplaces are solid beams carved on the faces, supported on either side by Italian travertine jambs extending across the breasts. Antique iron firebacks and travertine hearths complete the design of these fireplaces. The casement windows of the living room, which is open on three sides, are set in deep plaster reveals after the Italian manner, and their arched tops suggest the Italian palazzo architecture of the Gothic period. The floor is of broad oak boards, pegged, with the joints between filled with strips of ebony emphasizing the long rows of random-width planks. Of interest in the whole treatment, although really a furnishing, is the organ console set at the end of the room, designed and antiqued after the manner of a Florentine library desk, executed in carefully selected Italian walnut.

The entrance hall in general is carried out in the same manner as the living room. The plaster panels between the oak beams in the ceiling are enframed by plaster mouldings placed against the beams. The woodwork is oak throughout, specially selected and finished in antique character. The exquisitely paneled and moulded doors to the women's coat room and the organ room, together with the twisted column at the stair opening, are unusually rich in their design and contrast pleasantly with the plainness of the plaster walls. The floor also is unusual with its white marble squares and inserts of rich reddish pink Langue d'Oc marble. As a complement to this floor and a relief to the antique plaster treatment of the entrance hall walls, the walls of the hall are finished a deep Italian blue. Against these walls old pictures in antique gold frames are strikingly contrasted. This hall also serves to introduce the more finished treatment of the library and dining room.

The library is Tudor in style. Heavy carved doors of English oak, studded with antique iron nails and having solid board paneling with moulded stiles, a stone mantel, elaborately but crudely carved wood panels over the mantel, and antique carving in the cornice, are details which have been carefully designed and executed, to give character to the whole. The paneling is richly done and is hand worked and antiqued and treated to resemble old English work. The floor here is like that of the living room; broad oak boards are pegged down. The woodwork itself is finished in the rich, nearly natural brown of English oak. The electrical fixtures, as in the rooms previously described, are made of wrought iron from special designs. The dining room, which was remodeled and enlarged, was entirely paneled in wood, treated with an interesting crackled painted surface in two tones of a warm cream-gray, bordering slightly on a yellow-brown. The marble mantel is old

View from the Circular Garden Toward the Original or Central Part of the House

ONE OF THE TWO LARGE FIREPLACES IN THE NEW LIVING ROOM

THE HALL CONNECTS THE NEW WINGS WITH THE ORIGINAL HOUSE

HOUSE OF MYRON C. TAYLOR, ESQ., LOCUST VALLEY, N. Y.

RICHARDSON, BAROTT & RICHARDSON, ARCHITECTS

LIBRARY

THE LOW CEILED DINING ROOM IS MORE FRENCH THAN COLONIAL IN CHARACTER

THE BAY WINDOW IN THE DINING ROOM GIVES A VIEW OF THE FLOWER GARDEN

HOUSE OF MYRON C. TAYLOR, ESQ., LOCUST VALLEY, N. Y.

RICHARDSON, BAROTT & RICHARDSON, ARCHITECTS

French, purchased by the owner, and its incorporation with the wood finish lends a French character to the entire room. Of interest also is the floor, made of broad boards of curly pine, laid in random widths and pegged and finished dark.

The second floor is as carefully executed in detail as the first. The hall carries out the design and style of the first floor hall. The owner's suite is executed in the Colonial style of the late eighteenth century, the period dominated by Bulfinch and Mc Intire and a few other designers of equal renown. The woodwork is confined to wainscot, door and window trim, and bookcases. Particularly interesting are the delicate moulded panels of the doors and wainscot and the carved trim. Above the wainscot the plaster wall extends to the ceiling, where it is crowned by a finely moulded plaster cornice. The walls are painted a warm gray, and the woodwork is glazed in ivory. The marble Adam mantel, which is an original, is appropriately set in architecture of the Colonial period, which was influenced so much by the brothers Adam. The floor is a series of squares, set diagonally and made up of teak boards. The guest bedrooms are also Colonial, but designed in an earlier style than that used in the owner's suite.

No interiors can be properly developed in design without appropriate furnishings given a proper setting. When this is accomplished the full beauty of a room is secured. The taste which the owner has shown in his furnishings is apparent, as many of the pieces and hangings are originals and well supplemented by others in keeping with the type of the architecture. With rare good taste and perfection in decoration, the rooms of the various parts of the house have been transformed into delightful country house interiors, satisfying in beauty and design. It has been aptly said that "in this house of Mr. Taylor's one finds the atmosphere of luxurious Venice, enclosed by an exterior of New England simplicity."

EDITOR'S NOTE.—In presenting the illustrations and plans of the alterations to Mr. Taylor's house, it is a pity that space does not permit reprinting the interesting article by the landscape architect, Alfred Geiffert, Jr., on the development and planting of the unusually attractive grounds and gardens around the house. This article, which was published in the Country House Reference Number of THE FORUM, in March, 1923, shows illustrations not only of the actual work of creating the landscape setting for the house, but also of the completed grounds the following summer. The views of the entrance and garden sides of the enlarged house, shown on pages 164 and 165 of this issue, give some idea of the naturalness and beauty of the surrounding landscape. The open lawn and well placed elms give scale and dignity to the approach to the entrance door, while the garden side of the house, with its comfortable living porch, appears secluded and private, as it should. Its *allee*-like vista over a flower-bordered lawn and terraced pool is well shut in on either side by garden walls and dense foliage.

The description of the alterations at Underhill Farm was written by Chester L. Churchill of the firm of Richardson, Barott & Richardson. This description gives an excellent idea of the problem involved in these alterations and the manner in which the architects met and solved it.

An Antique Marble Mantel and Built-in Bookcases Add Interest to the Upstairs Salon

The Remodeled Masonic Temple, Birmingham, Ala.

WARREN, KNIGHT & DAVIS, Architects; HARRY B. WHEELOCK, Associated

AN architect meets few problems more difficult to solve than the remodeling of a building, especially where occupancy continues during the work. Such was the case with the Masonic Temple at Birmingham, Alabama, where the original building, occupying a corner lot 50 by 100, was kept almost intact and used for Masonic purposes during the operation of remodeling and enlarging the building to occupy a lot 175 by 190.

The first plans, which showed new wings on both sides, left the original building unchanged. But before bids were received on the first scheme, the architects persuaded the owners to make the completed work appear as a single building. For the sake of sentiment and because of other reasons it was decided to leave the old building practically unchanged as to interior plan. As it was undesirable to repeat the type of design of the exterior of the old building in the new addition, the original front was changed to conform to the new design and to make the entire exterior of uniform appearance. The preserving of the interior plan of the old building and making a new exterior to give the effect of a single building was a difficult problem. The width of the bays on the two street fronts of the building as well as the story heights, had to be preserved. This was accomplished by the use of double pilasters and a high entablature and attic, executed in severe Classic detail. As the entrance at the center of the old building had to be retained, a second entrance to balance it was placed at the other end of the main facade.

Although the various rooms and auditoriums of the interior remained unchanged in plan, they were completely built over and given an architectural, decorative treatment in harmony with the Classic character of the present, transformed exterior design.

Principal Facade of the Masonic Temple, Birmingham, Alabama

Photos. Tebbs & Knell

BALCONY AND DAIS IN THE LODGE ROOM

SIMPLE ITALIAN RENAISSANCE DETAIL WAS USED IN LODGE ROOM

THE MASONIC TEMPLE, BIRMINGHAM, ALABAMA

WARREN, KNIGHT & DAVIS, ARCHITECTS; HARRY B. WHEELOCK, ASSOCIATED

LIBRARY

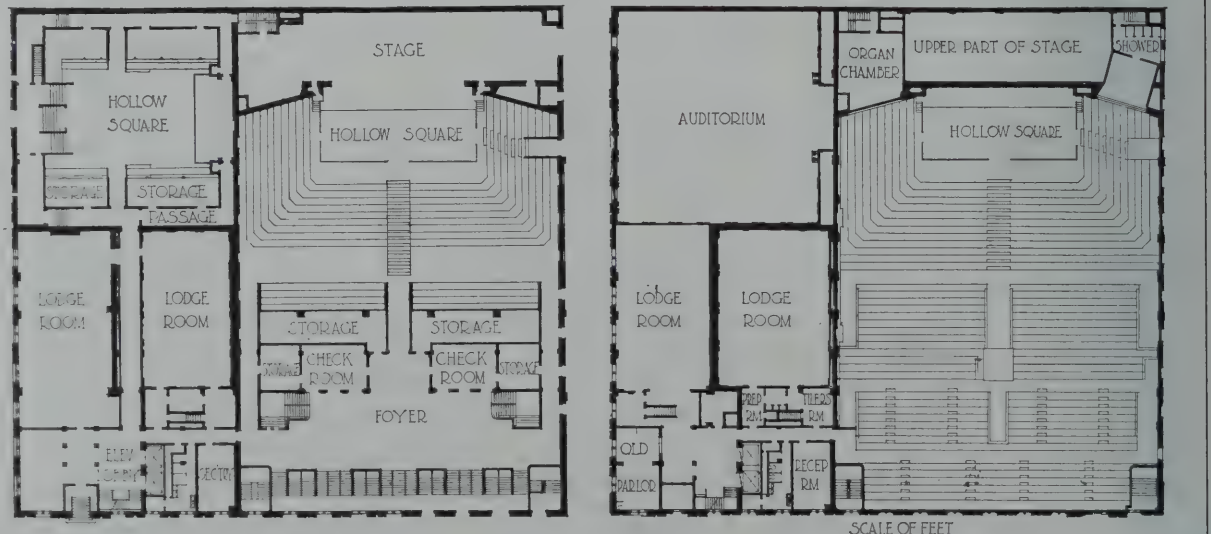
AUDITORIUM AND MAIN ASSEMBLY HALL

CORNER OF SCOTTISH RITE ASSEMBLY ROOM

THE MASONIC TEMPLE, BIRMINGHAM, ALABAMA

WARREN, KNIGHT & DAVIS, ARCHITECTS; HARRY B. WHEELOCK, ASSOCIATED

DETAIL OF THE LODGE ROOM SHOWING DECORATIVE FRIEZE



FIRST FLOOR PLAN

SECOND FLOOR PLAN

THE MASONIC TEMPLE, BIRMINGHAM, ALABAMA

WARREN, KNIGHT & DAVIS, ARCHITECTS; HARRY B. WHEELOCK, ASSOCIATED

The Smaller Civil Architecture of England

III. THE COUNTY SESSIONS HOUSE, WARWICK

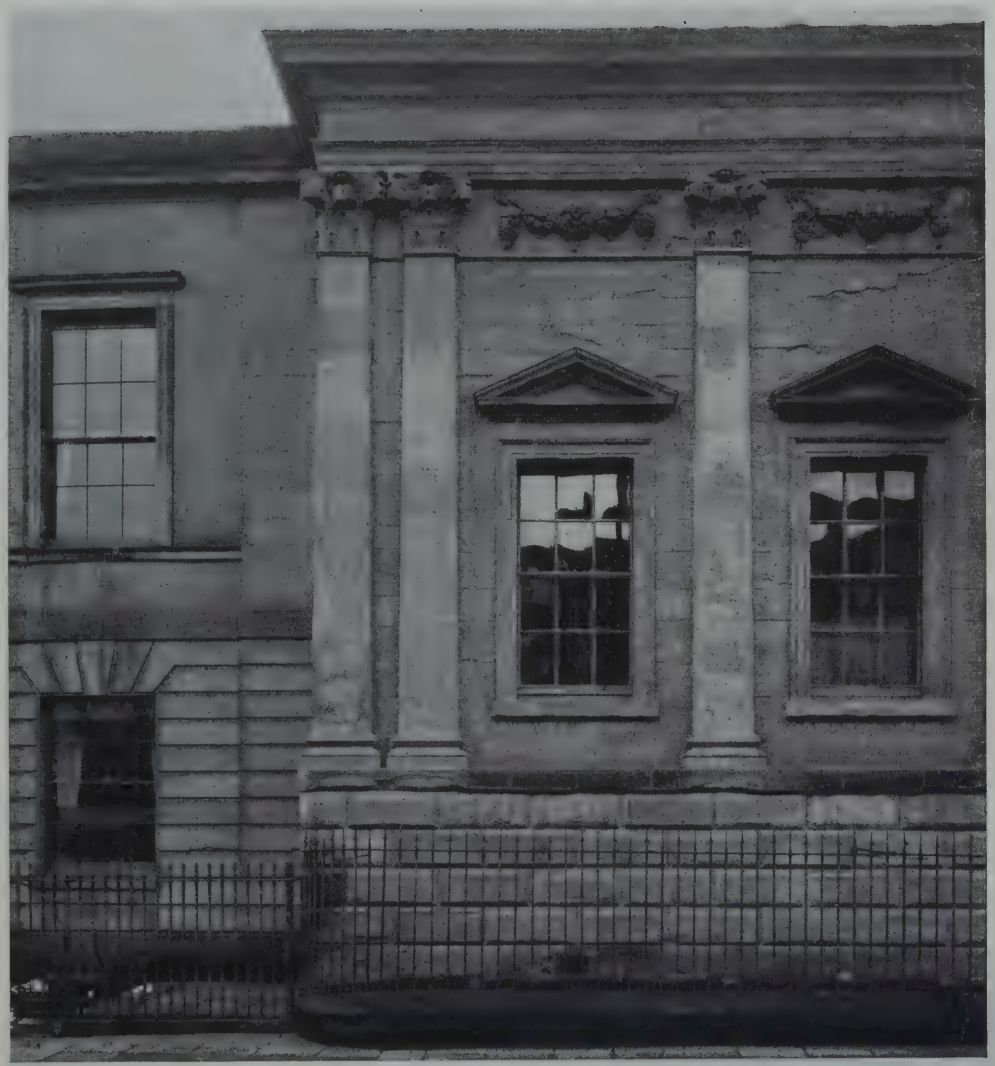
By ROGER WEARNE RAMSDELL and HAROLD DONALDSON EBERLEIN

THE County Sessions House at Warwick, otherwise very generally known as the Shire Hall, is in many respects the most noteworthy of a number of public structures designed for the town during the latter half of the eighteenth century by that stylistically versatile architect, Francis Hiorne, F.S.A.

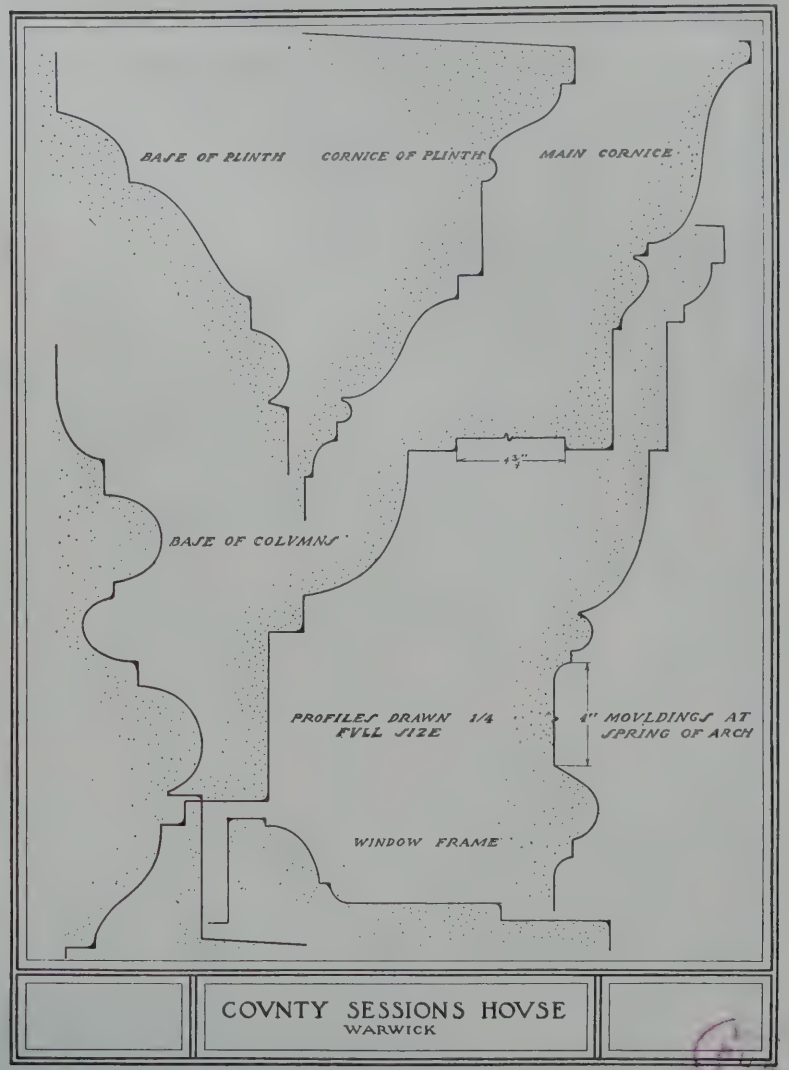
The "Dictionary of Architecture" tells us that Francis Hiorne was "one of the earliest practitioners of the revived Gothic architecture." Among the buildings accredited to his hand, though by no means all of them Gothic, are the vestry and lobby at the east end of the north aisle of St. Martin's Church, Birmingham; the church at Stony Stratford, built in 1776; the offices to "Goppeshull" or "Gopsul Hall," near Leicester; he built, some time before 1786, a triangular tower in the home park at Arundel Castle, Sussex, for the Duke of Norfolk, besides suggesting "several of the improvements at that castle, having a very just conception of the genuine style of the Gothic military architecture,"; a church in the fifteenth century Gothic manner at Tetbury, in Gloucestershire; "Foremark," Derbyshire, in the Italian mode, for Sir Robert Burdett; and one of the gates, the Town Hall, the County Jail, and the County Sessions House, at Warwick, all these public works in the county town of Warwickshire being much "commended for their convenience and the simplicity and good taste of their architecture," commendation which is amply merited.

Of the last named edifice, the subject of present discussion, Britton's "Beauties of England and Wales," published in 1814, says: "The County-hall is a spacious and ornamental structure, erected in the 31st of George II by Mr. Hiorne, an architect of considerable judgment, who was a native of Warwick. The front is of a chaste and dignified character; the interior is judiciously arranged, and sufficiently spacious." The foregoing quotation is right insofar as it ascribes Hiorne's birth to Warwick—he was born there in 1741—but it is quite wrong in giving "the 31st of George II" as the date of building the County Sessions House, for this would have made it the work of a lad of only 16 or 17, a performance manifestly impossible in the face of visible evidence. The County Sessions House is a mature and well considered piece of civic architecture, not the fantasy of an infant prodigy just out of school. The date 1769-1770 is usually accepted as correct and is altogether reasonable, although it is interesting to note that the architect, despite the contemporary ascendancy of the style popularized by the brothers Adam, held consistently to the ideals and precepts of an earlier day, at least so far as the elevation is concerned, thereby exhibiting a degree of personal conviction and also of virile independence.

General View of the County Sessions House, Warwick

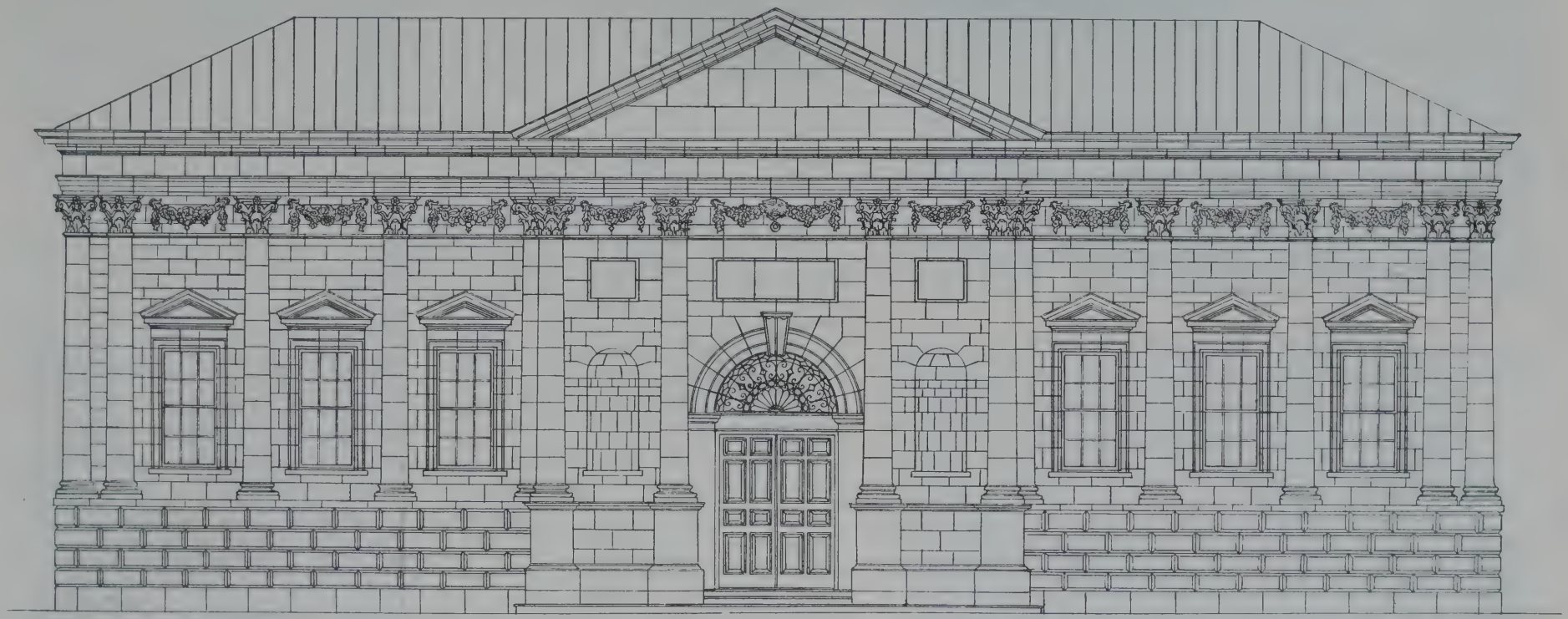


DETAIL OF THE TWO END BAYS OF THE MAIN FACADE, SHOWING CLASSIC INFLUENCE IN DESIGN AND PROPORTION OF WINDOWS AND IN THE CORINTHIAN ORDER



SECTIONS THROUGH BASE OF COLUMNS, MAIN CORNICE, PLINTH AND WINDOW FRAME, SHOWING CARE AND REFINEMENT

THE COUNTY SESSIONS HOUSE, WARWICK



SCALE 3/32" = 1'-0"

COVNTY SESSIONS HOVSE

WARWICK

PUBLIC PUB

The Center Bay Has Engaged Columns Surmounted by a Pediment Still Uncarved

Entrance Doors into the Great Hall Are Flanked by Pilasters and Niches Set in Panels

In the plan, however, the later influence is perceptible in the arrangement of the court rooms and the lobby at the rear of the great hall, where the designer has evidently had in mind the ingenious diversities of geometrical forms so much in vogue at the period. The interior of the great hall, a room of considerable dignity and satisfying proportions, is entirely executed in the same fine grained, light tawny brown sandstone used for the exterior, save where subsequent alterations have been made, shutting off the court rooms from the great hall. Originally the court rooms were separated from the great hall only by colonnades with heavy curtains hanging between the columns. It is cause for sincere regret that this early arrangement should ever have been changed. Some of the stateliness has been lost by it.

As the illustrations show, the carving in the pediment was never finished. Elsewhere all the details of the facade are exquisitely wrought. The carving of the swags and drops, as well as that of the capitals, is vigorous and thoroughly convincing. In the carved decoration of the great hall the same qualities are seen in a considerable degree.

Francis Hiorne died in 1784 or 1789 (the date is variously given), and was buried in St. Mary's Church, Warwick, where there is a tablet to his memory on the south wall of the chancel. Had he left nothing but the civic work in his native town, that would be quite enough to entitle him to our thorough respect and to cause his fellow townsmen profound satisfaction that achievements of such merit were compassed by one born on the spot.

Detail Showing Capitals and Carved Decorations of the Center Bay

House of Dr. P. S. Chancellor, Millbrook, N. Y.

EDWARD C. SMITH, Architect

A CERTAIN fine simplicity and subtle dignity characterize what architects know as the "French chateau" type, and as one recalls the various efforts made in America to interpret the style in present-day building, it will be found that with scarcely a single exception these efforts have been successful. This may be due partly to the fact that use of the type at all is likely to involve an expenditure sufficiently large to build upon a scale generous and adequate, and partly to the fact that selection of the chateau type is in most cases due to fondness for it formed in its native France, and this presupposes a certain degree of culture which permits its correct interpretation as to character, materials, decoration and furnishing.

This American country house suggests such a minor chateau as might be found in many parts of the Loire country. In this instance the character of the entire building might be said to have been established by an old French architrave of carved stone which forms the main entrance doorway, reached from a low platform one step above the ground. Walls of the structure are of brownish buff stucco applied in an uneven and rugged manner, the walls being furred within to create deep reveals at the doors and windows. The sweeping roof surfaces are unbroken by the dormer windows which give a restless, confused appearance to so many country houses, and are covered with slates of random thicknesses and different widths, the slates showing a color blend of purples, greens and blues, with considerable russet which agrees with the color of the walls themselves. Excepting the blinds and shutters, which have been stained blue, the exterior woodwork is of chestnut and stained a mellow, walnut brown. Brick used for the exterior were clinkers obtained from the local brickyard. All porches, terraces and exterior steps, as well as the floor of the entrance vestibule, like the platform before the main doorway, are of old stone flagging laid in black cement, agreeing well with the character of the building.

The interior, instead of being characteristically

Forecourt and Entrance Front of House of Dr. Chancellor

VIEW OF LIVING ROOM, SHOWING ANTIQUE STONE CHIMNEYPIECE

ANTIQUE MANTELPIECE AND DOOR TRIM IN LIBRARY

Photos, Kenneth Clark

One of the Bookcases in Living Room

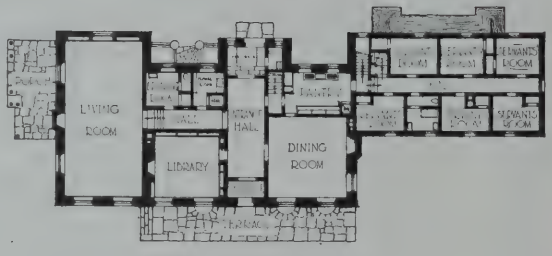
A Corner of the Dining Room

French, represents a mixture of architecture, furnishings and accessories which are French, Italian and Spanish, the house having been planned to form a setting for many antiques, acquired during several years of foreign residence. Interior walls for the most part are finished with hard plaster, troweled to a slightly rough surface. The ceiling timbers of certain rooms are of chestnut, cut near the site of the house and adzed to resemble old work; all interior trim for batten doors, plank ceilings in certain rooms, stairs and other trim were worked from wormy chestnut, stained and waxed; and most of the floors are of random-width oak, nailed and pegged, a few dowels being used in certain places.

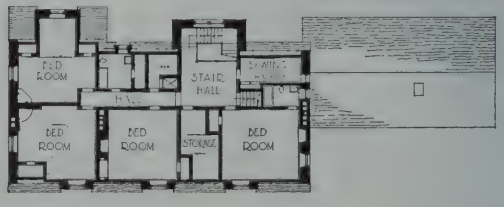
Antique Stone Entrance Doorway

Side Hall Leading to Living Room

FIREPLACE AND BOOKCASE IN LIBRARY

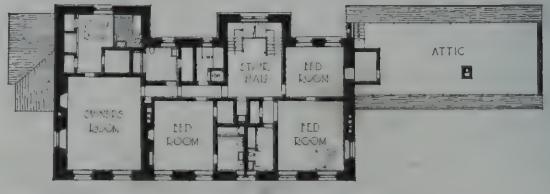


FIRST FLOOR PLAN



THIRD FLOOR PLAN
SHOWING ADDITIONAL GUEST ROOMS

BASEMENT PLAN SHOWING KITCHEN, LAUNDRY
AND GARAGE ON LOWER LEVEL



SECOND FLOOR PLAN SHOWING FAMILY BED
ROOMS AND ATTIC OVER WING

BOSTON PUBLIC LIBRARY

HOUSE OF DR. P. S. CHANCELLOR, MILLBROOK, NEW YORK
EDWARD C. SMITH, ARCHITECT

The West Virginian Hotel, Bluefield, West Virginia

MAHOOD & VAN DUSEN, Architects

THE design and planning of a hotel for a city such as Bluefield, with a population of 25,000 or 30,000, presents a problem to the architect altogether different from that of the design of a hotel for a large city. A large factor in determining the number of rooms and general layout for the "West Virginian" was the necessity of working out an economical scheme and, at the same time, one that would be attractive and sufficiently large to allow for the growth of the town and for future additions to the hotel. The final scheme as worked out by the architects was for a building L-shaped in form, planned to fit the site, and 12 stories in height. The main entrance is on one street, the women's entrance on another, a third entrance is on still another street, and there is a service entrance from an alley in the rear. The surroundings of the building are such that outside light and ventilation are had on all sides, thus giving daylight and air to all the rooms.

One wing contains a coffee shop on the main floor and a ball room above. From the lobby there is also a women's entrance from a side street, and a corridor leading to an entrance from the principal street. Adjoining the lobby is the main dining room, and in the rear of the building are the coffee shop, kitchen and storerooms. On the mezzanine floor are located a large lounging room, ball room, check room, three offices, a private dining room and serving pantry. From the mezzanine floor up, the floors are typical, each floor containing 24 bedrooms, each with a bath. The penthouse contains valet's room, sewing room, carpenter shop, and water supply, exhaust fans and elevator machinery.

It was found necessary to use concrete piles for the foundation work. The construction is fireproof throughout, being of steel frame with concrete floors. For the exterior a combination of brick, limestone and terra cotta has been used. The walls up to the third floor are of limestone, from which point to the 12th floor they are of buff brick. From the 12th floor to the cornice line the building is faced with limestone, decorative panels in terra cotta occurring between window openings. Crowning the whole structure is a terra cotta cornice of excellent scale and detail. The exterior shows restraint in use of ornament and is effective in mass, detail and combination of materials,—a simple, dignified and pleasing building.

The same simplicity and restraint are shown within, where the ornament, most of which is in the Adam style, has been used only for contrast, and where it would be effective. At the main entrance there is a large marquise of wrought iron finished in bronze. Two revolving doors lead to the main vestibule, which is finished with travertine floor and walls. The segmental ceiling is decorated with ornamental plaster. There are three steps up to the lobby floor level and steps down, on either side, to the basement floor level. Wrought iron balustrades of Adam design are used at the stairways.

The lofty appearance of the main lobby is aided by the open well between main floor and mezzanine. There are three large windows at one side, and on the opposite side are the clerk's desk, manager's office and cigar counter, separated from the lobby by a low wainscot of marble with pilasters and cornice of birch finished in walnut. Two passenger elevators are at the side of the lobby opposite the entrance vestibule. All walls are finished in plaster stippled in a warm buff. Columns and the heavier ceiling timbers have been decorated with ornamental plaster finished in bronze, old ivory and blue. The lobby has been given a homelike atmosphere notwithstanding its size and height, and an air of hospitality has been achieved largely by careful selection and placing of furniture. Chairs and settees are upholstered in tapestry and velvet; rugs are thick and of colors which add warmth to the floors of terrazzo and marble.

The dining room is somewhat similar in design to the lobby. The detail here is also Adam. The walls are stippled in gray tones which furnish

General View of the West Virginian Hotel

LOUNGE ON THE MEZZANINE FLOOR

MAIN ENTRANCE LOBBY

THE WEST VIRGINIAN HOTEL, BLUEFIELD, WEST VIRGINIA

MAHOOD & VAN DUSEN, ARCHITECTS

Photos, Underwood & Underwood

LIBRARY

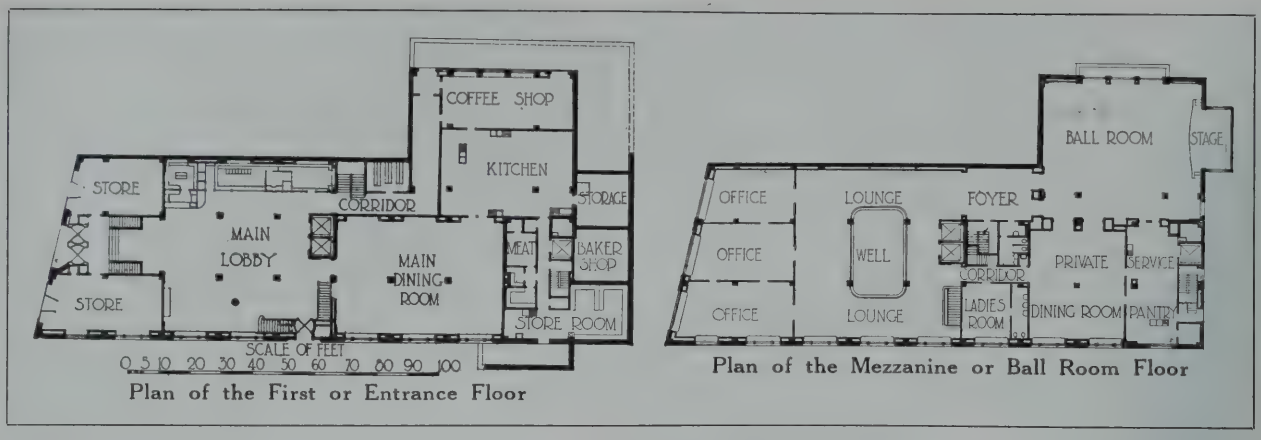
PRIVATE DINING ROOM ON THE MEZZANINE FLOOR

BOSTON PUBLIC LIBRARY

MAIN DINING ROOM

THE WEST VIRGINIAN HOTEL, BLUEFIELD, WEST VIRGINIA

MAHOOD & VAN DUSEN, ARCHITECTS



Plan of the First or Entrance Floor

Plan of the Mezzanine or Ball Room Floor

a fine background for draperies of turquoise blue which are used on two sides of the dining room, for the windows on the one side, and for balancing mirrors of similar size on the opposite side. The lighting fixtures agree in scale and detail with the plaster ornament, giving a pleasing effect of lightness and simplicity to rooms where they are used.

The mezzanine lounge, directly above the main lobby, is of practically the same size and was made to harmonize with it in design, color and finish. Writing desks are placed in the corners against the walls, and chairs and settees are grouped at various points. From the lounge there are entrances to the three office rooms in front and to the women's parlor, private dining room, and ball room. There is a foyer between the lounge and the ball room with check rooms and smoking room. The ball room is of excellent proportions, having a high segmental ceiling and a stage for musicians at one end. There are three openings at one side with full height glazed wrought iron doors opening upon a balcony. Walls and ceiling are decorated with ornamental plaster. The walls have panels on three sides filled with decorative paintings. Walls are tinted in light blue, and draperies are mulberry. Adjacent to the ball room is the private dining room. The two may be thrown together for dances by means of two large openings with double doors. There is a large service pantry which serves both the private dining room and the ball room when it is used as a banquet room or for other purposes involving kitchen service.

The ten bedroom floors are alike in number of rooms and arrangement, but the rooms vary in size. Each room has a closet and bath. Two-thirds of the rooms have tub baths, and the remainder have shower baths, every room thus having its own bath.

Main Stairway Over Ladies' Entrance

Main Lobby and Entrance Hall

The Phoenix National Bank, Hartford

DENNISON & HIRONS, Architects

MODERN banking buildings may be divided broadly into two general classes, (1) those devoted exclusively to the uses of the banks, and generally given a more or less massive and monumental appearance, and (2) those which contain, in addition to the banking quarters proper, considerable area that may be occupied by the bank as its business expands or else leased for various forms of business, chiefly of a financial character, which require quarters of a high degree of dignity and which may be appropriately housed in such a structure.

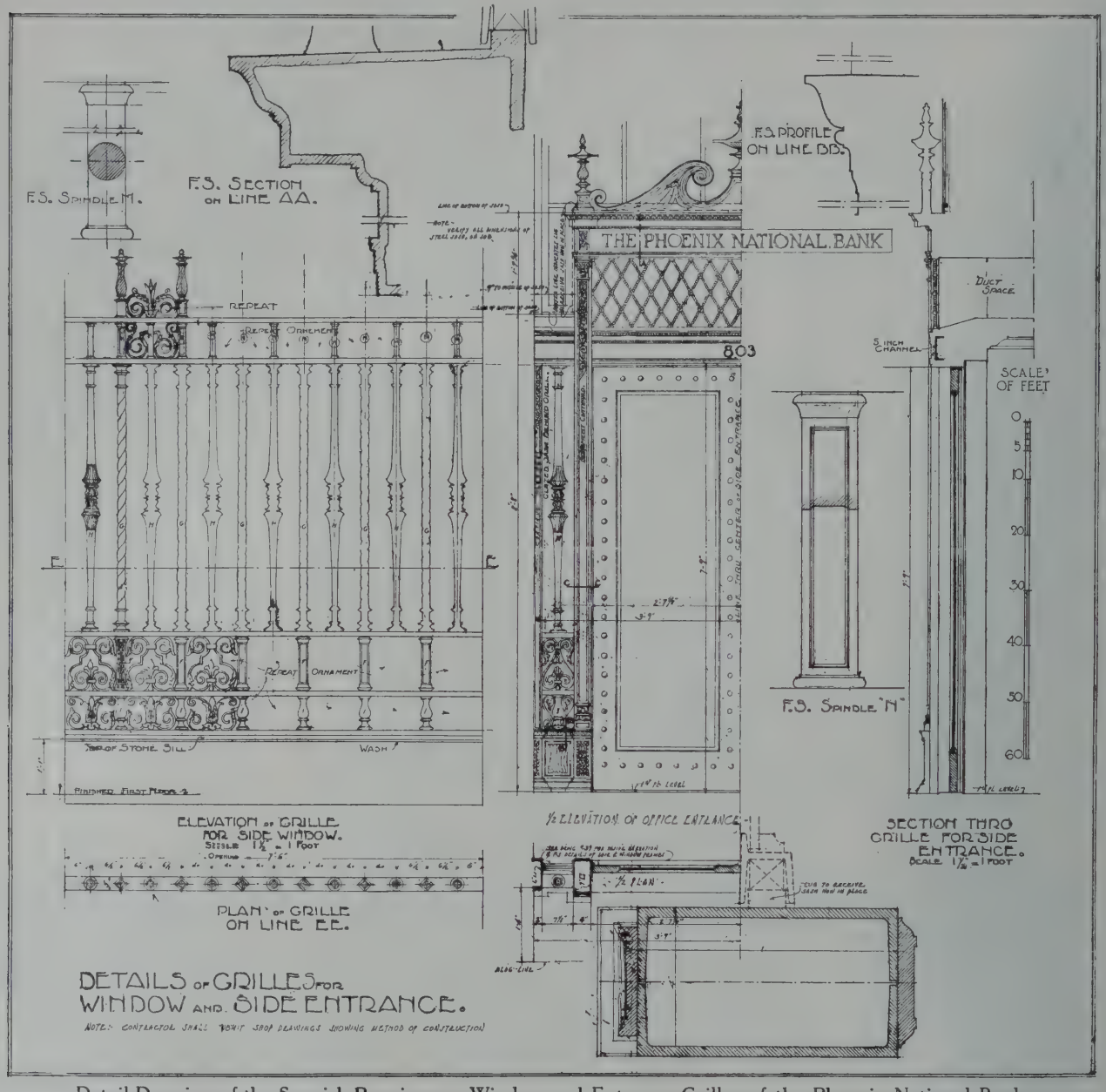
An excellent example of the type of banking building which contains a number of floors besides the banking quarters proper is the structure recently completed for the Phoenix National Bank, of Hartford. Erected upon the site which this bank has occupied since it was founded in 1814, and in the very heart and center of the business district of one of New England's historic cities, the building is first of all the home of an old and famous financial institution and only incidentally a structure in which other forms of business may be conducted. This strong emphasis upon the building's character is expressed in the design of its facade, rather simply planned in the style of the Italian Renaissance, a great portal at the middle of the facade leading from the sidewalk through a vestibule, protected by massive bronze grilles of Renaissance design, into the great banking room, three full stories in height, which occupies the greater part of the area of the plot. To the left of this main entrance to the bank is a large window protected by a bronze grille which lights certain of the bank's departments, while to the right and balancing this window is the entrance to the elevators which gives access to the upper floors of the building. Above this lower part of the facade, a massively designed basement of rusticated limestone upon a granite base, extend six additional stories, the windows arranged in bays and the walls between treated as pilasters which support a cornice. The entire exterior is simple and dignified, luxury being suggested by the excellence of materials and restraint of design rather than by lavish use of mere ornament.

The Original Sketch for the Phoenix National Bank
Drawn by Frederic C. Hirons

The banking room proper is all that the quarters of an old and distinguished bank should be. The visitor enters directly into a great room, floored with marble, the walls faced with travertine, and having a coved ceiling decorated with ornament in relief, the ceiling incorporating a skylight which with the windows facing the street gives excellent daylighting to the banking room. Various departments are so arranged about three sides of a square and upon a mezzanine at each side that the center of the large area is left open for public use, the marble counters or balustrades and the bronze grilles upon marble bases which separate these departments from the public area not interfering with the effect of space and openness which a room of such dignity should possess.

Upon the main banking floor are placed the departments with which the public comes into frequent and direct contact, such as receiving and paying tellers, the credit department, quarters of trust officers, etc., and a special department is provided for women patrons. Upon one mezzanine floor are placed the filing rooms, which it is desirable should be easily accessible from the working departments, and the large basement area is well arranged to provide spacious storage and safe deposit vaults, various committee rooms, coupon rooms and booths for the use of patrons, and toilet facilities for men and women depositors. A part of the second floor is taken up by the machinery which in most buildings is placed in a basement, where space is of small value.

The building, without as well as within, exhibits a careful use of ornament and of color. The richness

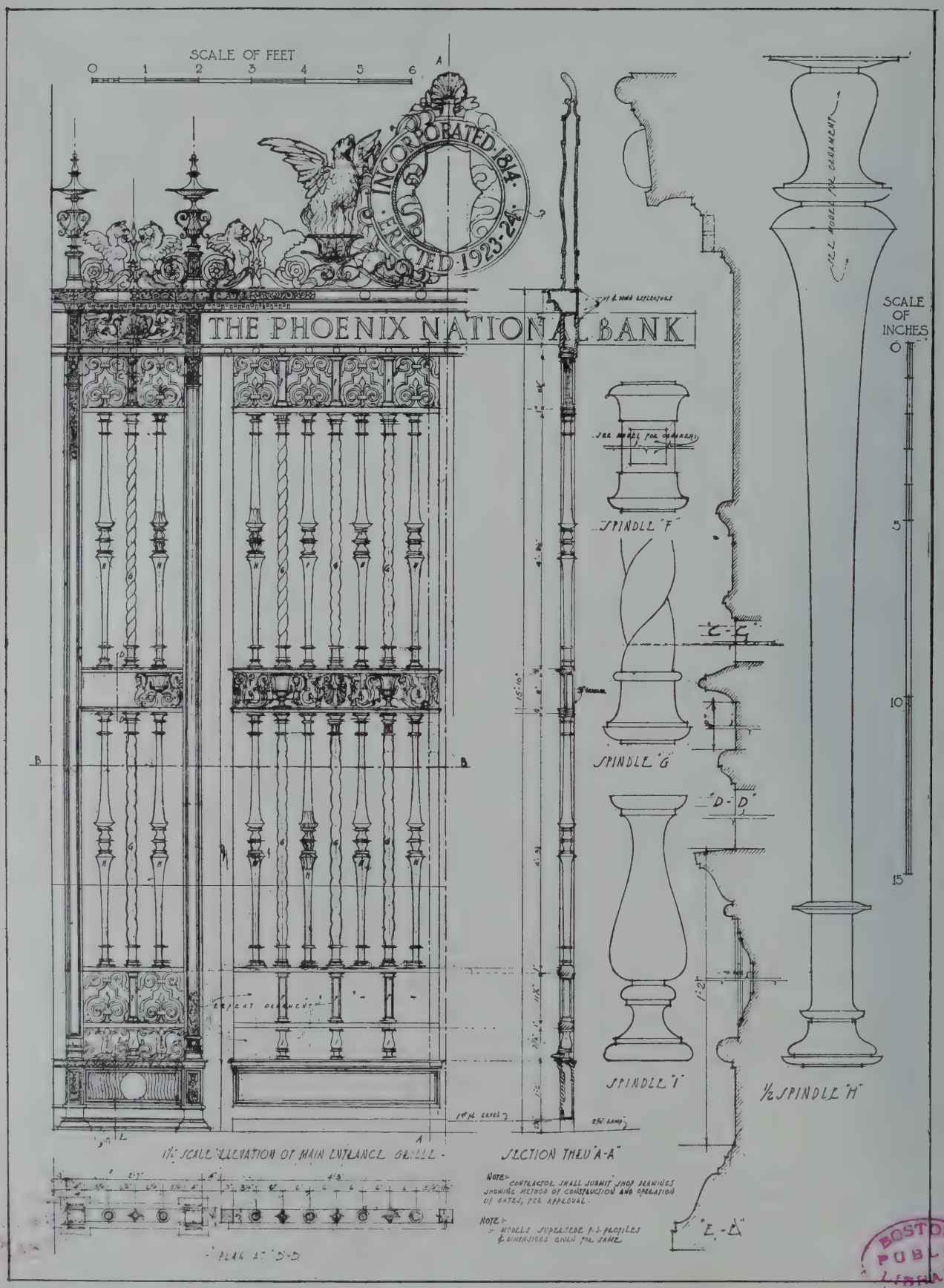


Detail Drawing of the Spanish Renaissance Window and Entrance Grilles of the Phoenix National Bank
Dennison & Hirons, Architects

of the granite and limestone used for the exterior is accentuated by carving in Italian Renaissance designs about the main entrance to the banking room, in the panels between the windows of the fourth floor, which in effect form a base upon which rest the pilasters of the floors above, upon the capitals of these same pilasters, in the cornice above them, and finally in the Phoenix, carved of limestone and with outspread wings, which tops the facade. Another decorative note is given the exterior by the bronze which in the form of grilles of Spanish Renaissance design guard the lower floor windows and the entrance doorways. Color is supplied within by the pale brown of the marble which forms the balustrades and counters and the bases of metal screens or grilles, by the richly textured travertine of which the walls are built, and by the bronze which is used in grilles, screens, and in balustrades between the arches of the mezzanine floor. Perhaps the one most striking detail of decoration which distinguishes the banking room is at the far end as one enters from the street,—a large panel of mural painting in color that fills an arched space which balances the great arched doorway that forms the main entrance. This mural decoration, which is the work of Edward Turnbull, is a map of Hartford studied from a survey made in 1814, the year in which the Phoenix National Bank was established. The map is highly decorative, in glowing tans and blues, and is interesting from a historical point of view, showing as it does the original plan of the city, its streets, and old buildings, some of which are standing today.

MAIN ENTRANCE GRILLE, ADAPTED FROM THE SPANISH RENAISSANCE
DENNISON & HIRONS, ARCHITECTS

BOSTON PUBLIC LIBRARY



DETAIL DRAWING OF THE MAIN ENTRANCE DOOR GRILLE
DENNISON & HIRONS, ARCHITECTS

BOSTON PUBLIC LIBRARY

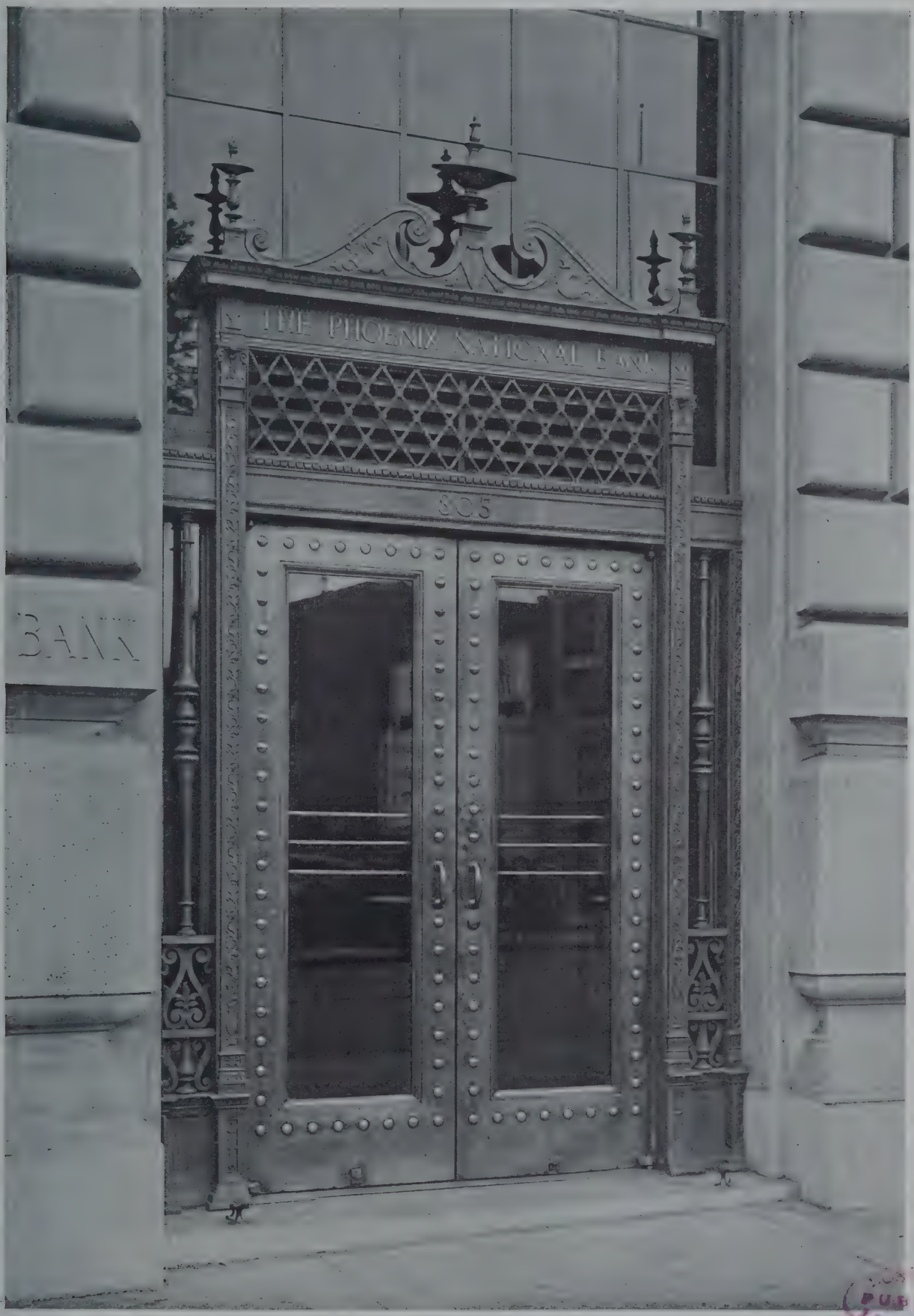
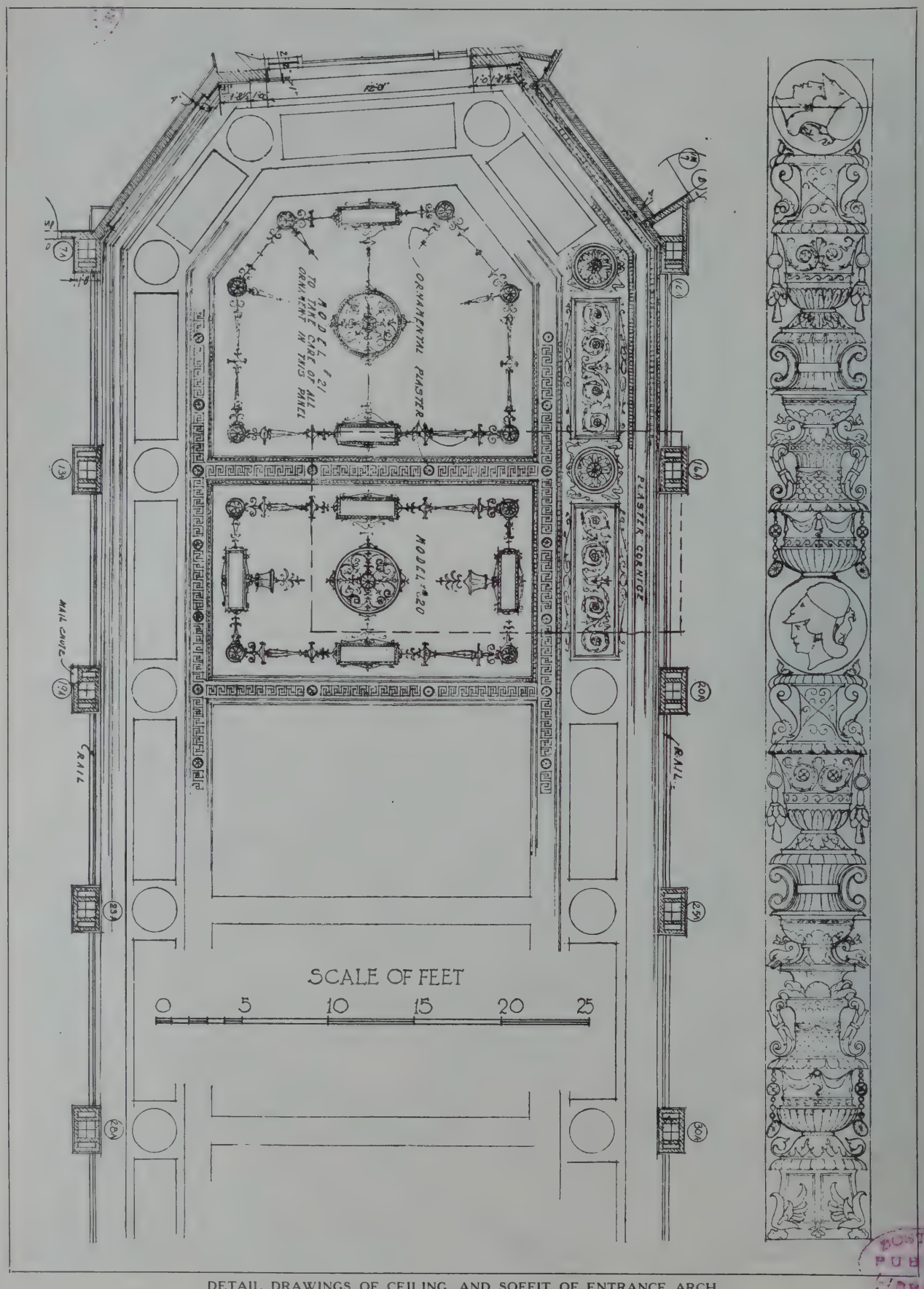


ILLUSTRATION SHOWING DETAIL OF SIDE ENTRANCE DOOR
DENNISON & HIRONS, ARCHITECTS

PUBLIC LIBRARY

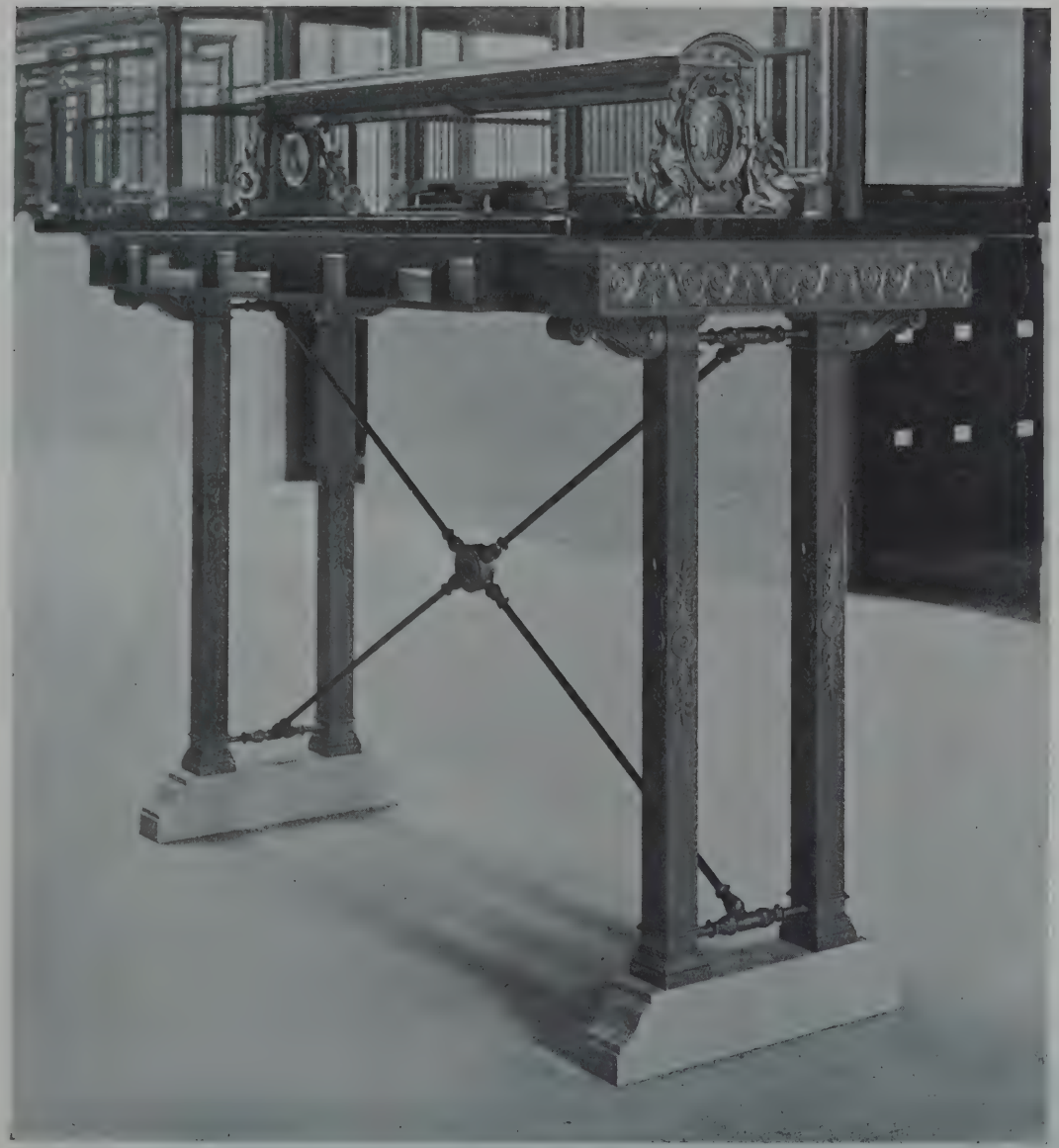


DETAIL DRAWINGS OF CEILING, AND SOFFIT OF ENTRANCE ARCH
THE PHOENIX NATIONAL BANK
DENNISON & HIRONS, ARCHITECTS

BOSTON PUBLIC LIBRARY

GENERAL VIEW OF BANKING ROOM
THE PHOENIX NATIONAL BANK
DENNISON & HIRONS, ARCHITECTS

BOSTON PUBLIC LIBRARY



BRONZE WRITING TABLE WITH RACK CONCEALING ELECTRIC LIGHTS

DETAILS OF TELLERS' SCREEN AND BALUSTRADE

THE PHOENIX NATIONAL BANK
DENNISON & HIRONS, ARCHITECTS

Decorative Coverings for Acoustical Materials

By CLAXTON B. MOULTON

FOR many years experiments have been made to correct acoustical defects in large halls, auditoriums, schools, etc. The success of these experiments is best evidenced by the ever increasing demand for acoustical treatment. Most important buildings having assembly halls are now designed to possess acoustical qualities.

Acoustical felt is now so commonly used in school and college buildings, theaters and business offices, that often the question arises as to how it may be concealed by decoration without impairing its acoustical value. In a plain classroom, laboratory or similar room, the thin cloth covering generally used answers the purpose satisfactorily. This seems a part of the walls or ceiling and is the least costly covering, but occasionally where the cost is of minor consideration and the effect is of great importance, such as where an auditorium or a hall is to be treated acoustically, the plain covering for the felt is quite unsatisfactory. The form of decoration which is the subject of this article is particularly suitable for such purposes. It is fortunate, from both an acoustical and a decorative standpoint, when this need is realized in the beginning and taken account of in the original plans, when the spaces to be treated and decorated become parts of the architectural scheme. When it is found necessary to treat the walls of a room already constructed, the easiest way is to hang the decorations in much the same way that tapestries are hung. They should be large enough to entirely conceal the felt which is placed directly on the walls.

Such decorations can be used wherever acoustical felt is required and where the room or building is of sufficient importance to justify their use. In churches, banks, colleges, theaters, court houses, club rooms, auditoriums and halls, such treatment would be pleasing, and a cold, somber and forbidding room might be changed into a cheerful, interesting place, since the color effect is rich and deep and the designs are made appropriate and interesting for the particular places in which they are intended to be used.

This form of decoration was first used, to the best of the writer's knowledge, in 1915, when the decorative panels for the Harvard Club of Boston were made. In this case the acoustical work was found necessary after the building was completed. Acoustical felt was hung upon the walls, occupying four similar spaces about 15 feet in length by 12 feet in width, and two spaces, one on either side of the entrance, about 15 feet in length by 8 feet in width. Temporary hangings of fine burlap, sewn into panels, concealed the felt. The natural color of the burlap toned in well with the walls, which are built of imitation stone.

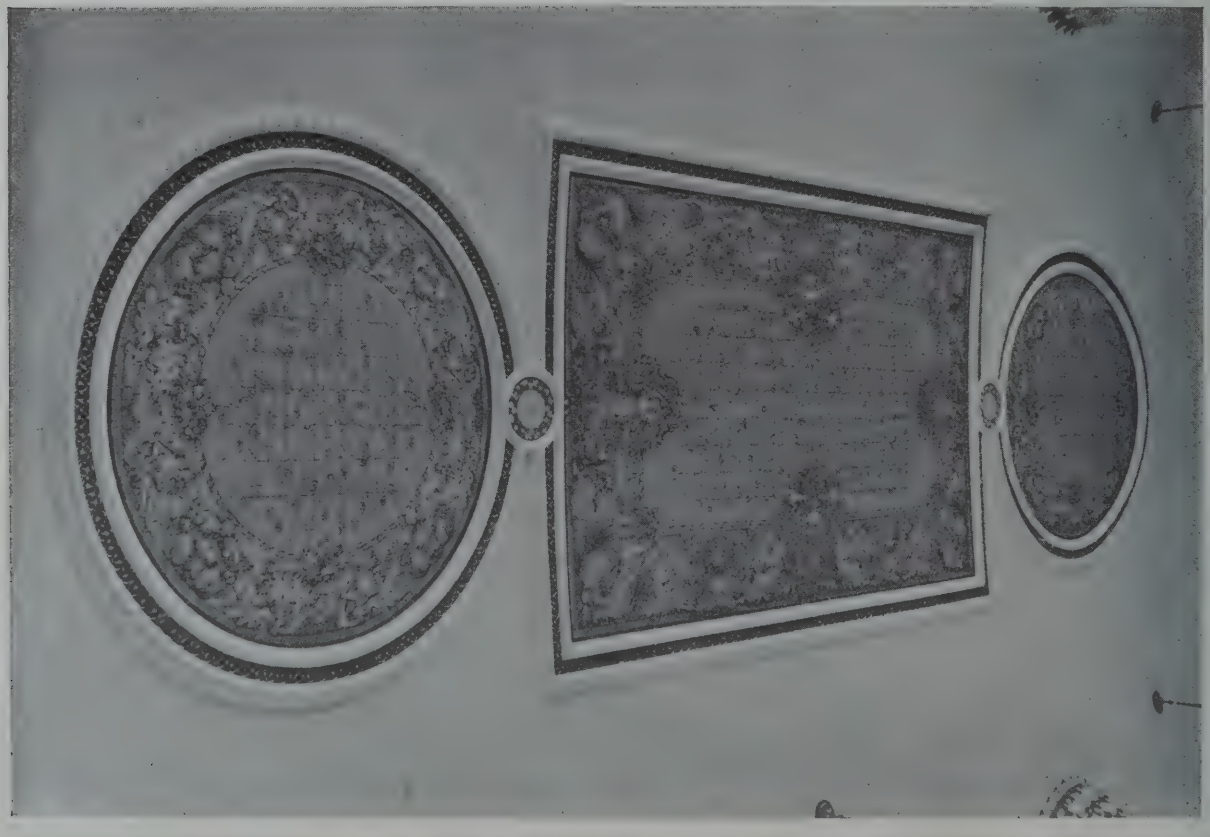
Decorative Panel in Alumnæ Hall, Wellesley
Painted by Claxton B. Moulton

It was intended to replace these temporary hangings with decorations, and tapestries were considered. The difficulty in such cases is to obtain a set of tapestries of the proper number, sizes and relation. It is difficult and expensive to buy antique tapestries, and good modern examples are also costly. After taking this into consideration it was decided to use painted panels, if they could be executed in a manner that would give an artistic result without interfering with the purpose of the acoustical felt. Upon investigation it was ascertained that only about 20 per cent of the interstices of material painted upon could be filled in order that the sound waves could readily penetrate the decoration and be affected by the felt. This would prohibit the use of sizing. Sketches were made, the subjects being some of the older buildings in Harvard Yard. Experiments in painting on

Wall Panels at Left of Stage

cloth were conducted, and the result was approved by the Committee. The use of a cloth finer and more expensive than the burlap, such as monks' cloth, had been considered for the decorations, but the experiments on burlap gave such excellent results that burlap panels were used. The general effect of the completed panels is that of tapestries, but it was never intended to attribute to them a fictitious value, and consequently they have always been referred to merely as "painted panels on cloth."

Ostensibly, to the general observer, such decorations fulfill the same function as tapestries. The acoustical felt beneath is as wholly unsuspected as is the practical value of the paintings. Where such paintings are used to cover acoustical felt, they have a distinct place in decoration. A little thought and understanding of their particular use would settle the question as to whether they should be classed as imitation tapestries or legitimate decorations, and with no connection whatever with acoustical felt. It is just as legitimate for an artist to work on an unsized cloth as a sized cloth, and the only essential difference between this form of painting and that on canvas is that the latter is sized. In each case the technique is limited or decided by the foundation to be painted upon. The fact that an unsized cloth is used accounts for the resemblance of such decoration to tapestries. For that matter, tapestries have been woven after paintings on canvas, and an attempt made to give the canvas technique. In the



Decorative Ceiling Panels, Alumnæ Hall, Wellesley
Painted by Claxton B. Moulton

earlier tapestries no such attempts were made, and they are true to tapestry limitations. Some of the earlier cartoons for tapestry were painted on an unsized material and are now rare and highly prized. It would be absurd to call these cartoons imitation tapestries, and they are practically the same as the acoustical decorations being considered here.

As already suggested, the best results are obtained when the need of acoustical work is realized in the beginning, when the spaces to be devoted to it can be so arranged that the decorative coverings become a part of the architectural scheme. Mouldings may enclose these panels with fine effect, and the decorations should be stretched taut and attached along the edges, an inner moulding covering the attachment. In this case they resemble painted panels more than those which are hung loosely, as is the manner of hanging tapestries. The acoustical felt is entirely concealed and unsuspected, and such paintings may be of great importance simply as decorations. The decorations for the auditorium of the Alumnæ Hall, Wellesley College, were provided for in the original plans by the architects. In this case the largest decorations are on the ceiling, covering felt that it was found necessary to place there. The ceiling is arched, and heavy decorative mouldings enclose these ceiling panels. The subjects of the wall decorations are scenes from the Wellesley campus.

It is of great importance that the relations of color shall not be altered or disturbed by artificial

Wall Panels at Right of Stage

Decorative Wall Panels in Alumnæ Hall, Wellesley
Cram & Ferguson, Architects

Photos. Paul J. Weber

lighting to the detriment of the decorations. If a set palette or color arrangement adapted to this kind of painting is used, a harmonious relation of color can be retained under artificial lighting. In viewing such work there is a generally steady effect of color from most points of view. There is a slight heightening or lowering of color from extreme points.

This form of decoration has certain practical advantages over tapestries in cases where they might come in competition with them as acoustical coverings. Tapestries are more closely woven; they are made from wool and are, therefore, subject to attack by moths, especially if hung in places difficult to reach. A set of acoustical panels can be designed and painted of the proper number and sizes, with subjects of special and appropriate local interest.

Decorative Painting on Burlap, Suggesting in Color and Design a Renaissance Tapestry
Painted by Claxton B. Moulton

BUSINESS & FINANCE

C. Stanley Taylor, *Editor*

Prospective Activity in Architects' Offices

At the beginning of the fall season, after a period of comparative dullness for many architects during the summer, there is reason to believe that architects generally will experience renewed activity in their offices, and that for many the projects will be of a more interesting type, particularly in the smaller offices, where it is quite possible that conditions will soon be better than for some years past.

It seems to be a fact that in spite of a record-breaking volume of building construction during the past three years, many architects have not greatly benefited. This condition applies particularly to those who have not yet developed large practices, and who have had to depend primarily on chance contacts to bring new projects into their offices. This condition may be ascribed to the fact that much of this building activity, particularly in the apartment house field, has been of a highly speculative nature which has not been interesting or profitable from the architect's viewpoint. Where he has had such projects to carry out, it has usually been the case that severe limitations have been imposed upon him, not only in the matter of design, but also in the choice of materials and equipment and in the fees which he might earn under a drastic condition of cost saving. Again, many of the larger projects have been developed into stages of promotion and financing which have excluded those architects not possessed of a high degree of business experience and considerable acquaintance with real estate promoters and operators.

The element of high building costs, together with unstable prices, uncertain delivery and labor conditions, has operated to the detriment of the architect in the home building field and has been the cause of many unfortunate experiences both for owners and architects. It has caused prospective home builders to seek in every possible manner to cut fees or to use stock plans, all in an effort to hold down the cost of the completed buildings. Conditions now seem to warrant the statement that this situation is showing a definite series of changes which may prove beneficial to the architect's business and which offer a fairly cheerful outlook on activity for 1925.

It can be noted definitely that the great wave of speculative building in the apartment house and residential fields has broken, and it may be expected that this condition will show its reaction in the stabilization of building costs and in the establishment of larger supplies of basic building materials which will facilitate deliveries and eliminate much of the delay which has proved costly on average construction work during the past few years. An example of this condition is the present common brick situation in New York, where ample supplies are to be had quickly and at reasonable cost. Similarly, the stocks of practically all other materials have been enlarged, and there has been a definite decrease in the cost rate, which while not great enough to cause an immediate reaction, promises stability which in turn encourages owners and building contractors with the possibility of providing definite and dependable cost figures. If this condition keeps up, as it probably will, promoters of many deferred projects of particular interest to architects because of their character will be encouraged to come into the market and to carry their projects to completion. It may be expected that the class of residences on which contracts will be let next year will be better than the average of the past three years. It is anticipated that a number of institutional, public and utility buildings will be built, and that of the total volume of new construction the proportion under direct control and of good architectural design will be greater than for some time past, if not greater than ever before.

Another important factor which may help to stabilize conditions within the near future is that of mortgage money. It may be said that at present mortgage money is easy to obtain for good operations, and that the need for good architectural design and practical planning is more definitely recognized by mortgage interests than ever before. The fact is now fully appreciated that new buildings constructed during this period must enter into competition, and that there is a better chance to maintain their intrinsic and investment values if such buildings are more attractive and of better construction than the speculative structures provided during the last few years to meet a condition of building shortage, many of which are poorly and inefficiently designed and constructed with cheap materials, carelessly used. Mortgage bond investment houses report that conditions in their business are good, and that the investing public is demonstrating its confidence in the building field by absorbing mortgage bond issues in a manner which is quite satisfactory to them. Similarly, in the loan departments of banks, insurance and trust companies, it is almost invariably found that money is available for investment in building and permanent mortgages, and that

appraisals and rates are fairly reasonable under existing conditions of building costs. There is a definite tendency on the part of mortgage interests to discourage highly speculative operations in the residential field, which is a condition primarily due to the fact that in many localities and classes of buildings the shortage which developed over several years has been partially or entirely overcome. It may be noted in this connection that the semi-annual survey by the National Association of Real Estate Boards shows that in more than half of the cities reporting, the shortage of apartments and business structures has been overcome, and that only 56 per cent of the cities report a shortage of single-family dwellings. A survey conducted last November revealed that in 68 per cent of the cities reporting, a shortage of single-family dwellings existed.

The building labor situation has not changed greatly as far as wage scales are concerned, but it is evident that there has been a considerable increase in the efficiency of labor. At the present time building labor is producing more and better work, which helps to remove some of the difficulties which have beset architects in the past. General business conditions are better than they have been for some months, and there seems now to be no danger of a period of dullness which was feared during the spring and early summer months. One economist has analyzed this situation in an interesting manner, and declares that while considerable irregularity and "spottiness" still exist throughout the business structure, there are well defined signs of improvement. The chief factor in the betterment, especially on the psychological side, has been the tremendous improvement in crop prospects and sharply higher markets for cereals. With wheat advancing to above $1.40 and corn passing the $1.10 mark, there is little wonder that hope has returned to the rural districts. Much less complaint is heard of the hardness of the farmer's lot, and bills of long standing in the country are being paid. The entire grain belt is being invaded by salesmen having almost every known commodity to sell, and their reports to headquarters are surprisingly optimistic. This wave of purchasing can be expected to surge back to the cities, and before many weeks will result in a genuine and solidly based revival in general business.

An examination of the charts shown in the Service Section of this issue of THE ARCHITECTURAL FORUM will bear out the statement that there will be increased activity in better class building. The charts on the second page show increased activity in school, institutional and similar building types, with a decrease in the value of contracts let in the residential field. While conditions in the building material fields are easier, it must not be anticipated that there will be any sudden or great decrease in building costs. It is more to be expected that there will be a gradual recession in prices over an extended period of years.

S. W. Straus, President of S. W. Straus & Co., makes this interesting statement: "As the fall season approaches there is indicated expectation upon the part of many that building costs are coming down. While there are always certain fluctuations in the costs of building materials, these advances and recessions are in large measure brought about through temporary local conditions, affecting prices in certain specific products. Economies in building are possible through increased efficiency."

Should there be any general reduction in building costs, it would be at the expense of building labor, and Mr. Straus is of the opinion that what would be gained in wage reductions would be lost in labor efficiency. The only circumstances under which labor would accept reductions in wages would be in the face of a sweeping reduction of all costs of living, which according to Mr. Straus would involve a sacrifice of values which is not desired by the people of the country. According to Mr. Straus, "the more logical solution of the building problems is stabilization of costs at approximately present levels; and there are consistent evidences that such a development is taking place. The abnormal activities which have been in evidence, particularly in the large cities of the country, for the last three years are being superseded by normal conditions. This cycle of building activity may be expected to produce stabilized costs, owing largely to the more evenly balanced conditions of supply and demand."

In recent discussions of the situation with a number of architects it was found to be the consensus of opinion that there is a definite revival of interest in high class residential, institutional and public building projects; also, to a somewhat smaller extent, in the school and religious building fields. It is reported that a number of clients have reappeared with projects which had been definitely laid aside because of unsettled conditions and the difficulty of competing with the demands of the speculative element in the building field. As this article is written, about the middle of September, a number of offices are taking on more draftsmen and clearing the boards for action. An optimistic tone is developing in small offices, as clients with residential and smaller building projects are beginning to stir, seeking mortgage loans and new estimates with the idea of proceeding with construction this fall or to be ready for the early spring building season. Many land developing companies are projecting high class residential developments which definitely require good and complete architectural service. These are the favorable signs of increased and more interesting activity in the offices of architects. Reports from the Pacific coast record a sharp revival of activity, beginning as early as August. Another contributing factor may prove to be the increased interest in winter building. This subject has received careful study on the part of various government and private associations, and much valuable information has been distributed to prove that many types of building projects can be carried on through the winter without increased cost. This is efficiency in another form.

EARLY AMERICAN DETAILS

A SERIES OF MEASURED DRAWINGS

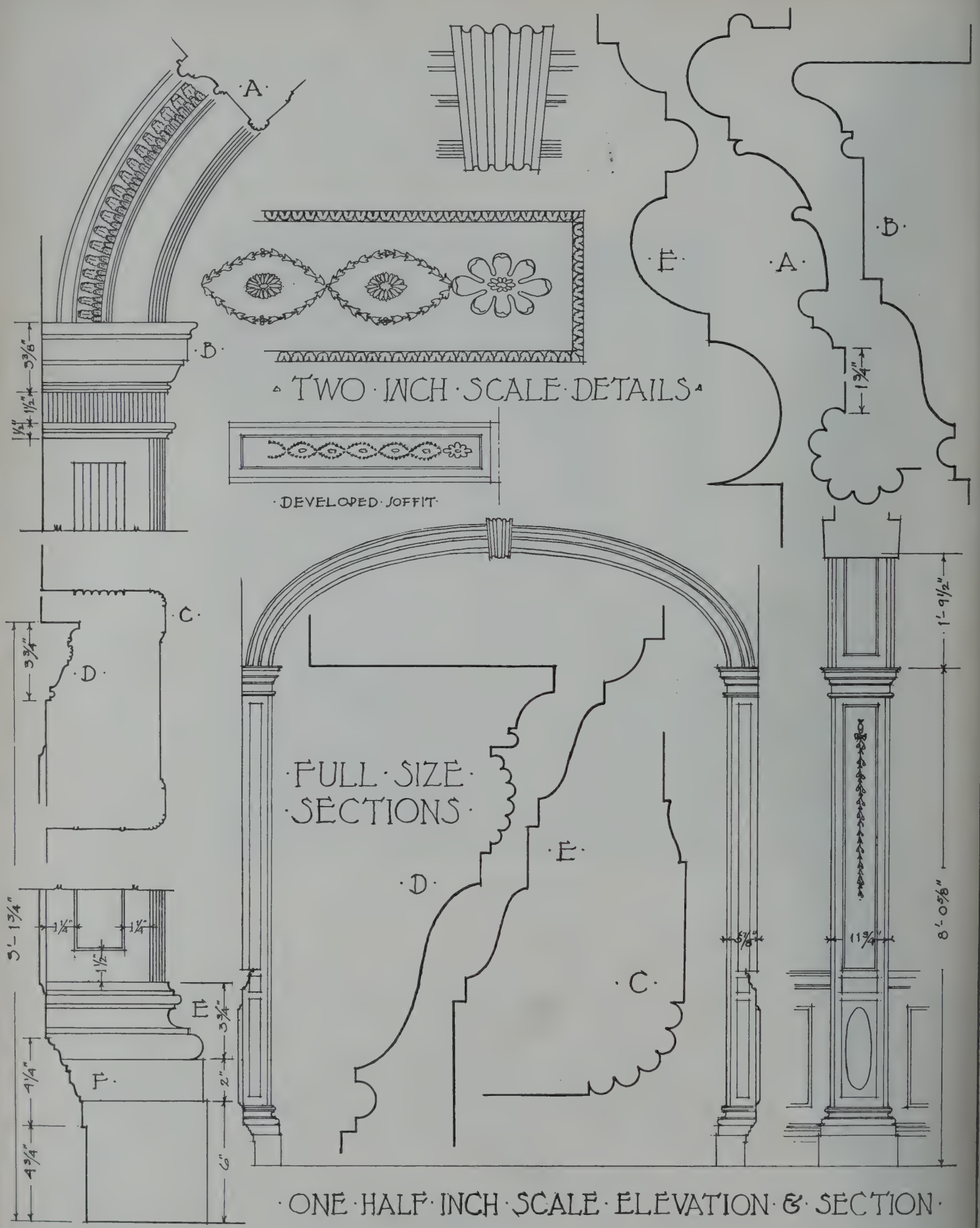
By RIGGIN BUCKLER

AN ARCH, BUILT ABOUT 1800

639 Columbia Avenue, Baltimore

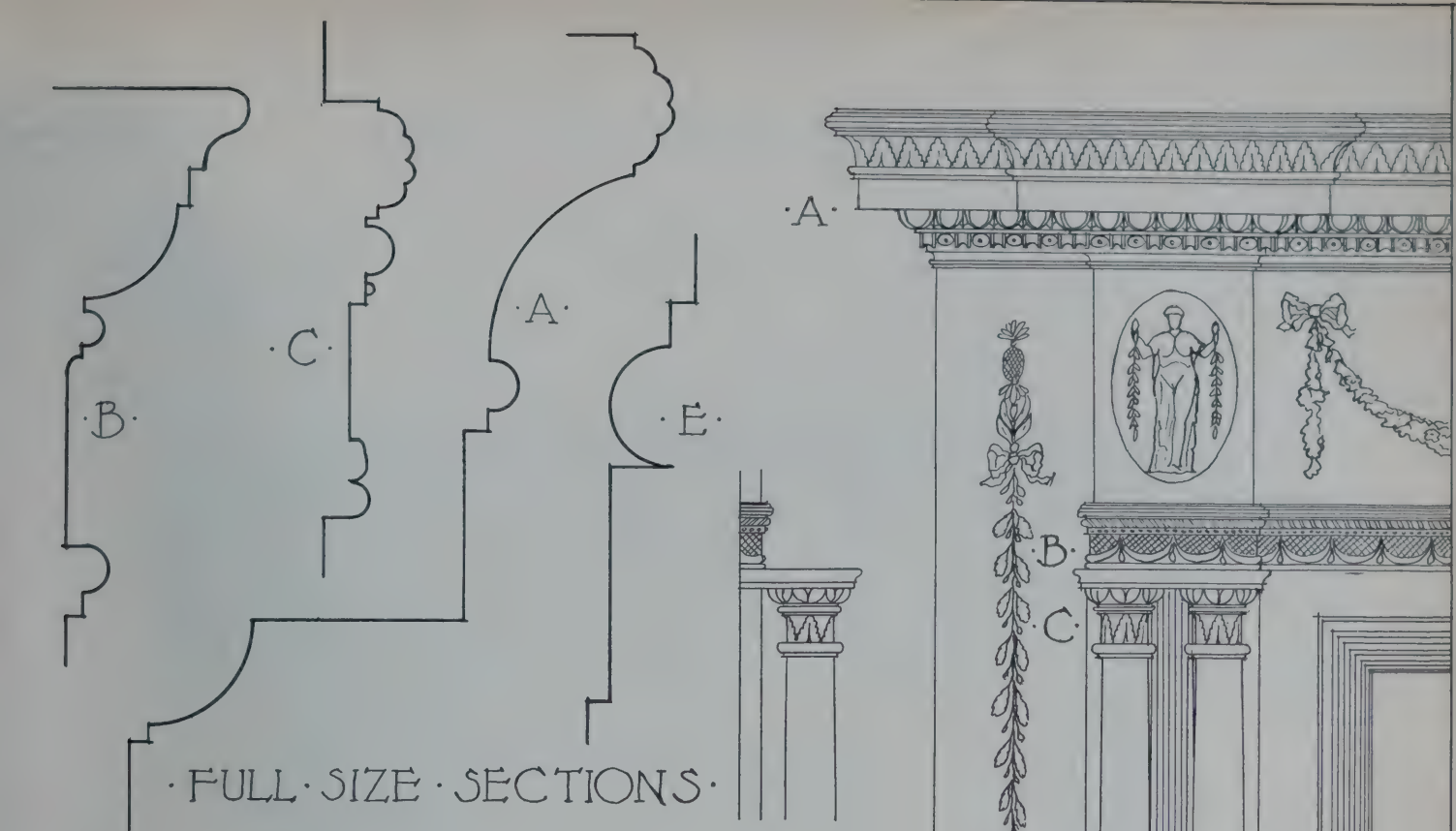
PLEASING as it undoubtedly is, this arch is scarcely to be regarded as representative of the best work which was being done in Maryland during the opening years of the nineteenth century. The proportions of the ellipse lack something of the grace which might easily have been given them, though this lack is somewhat atoned for by the excellence of the carefully designed and well executed ornament of the soffit and the two pilasters which support the arch.

Architects and builders during the Colonial and early Federal periods made much use of the arch. It was often successfully employed to break the severity of a long and sometimes narrow entrance hall, and it was not difficult to give the arch a form which was distinctly architectural. Where used to divide a hall, as in this instance, the wainscot which was generally employed could be made to tie in with the pilasters which supported the arch in a manner which added dignity to the entire composition.

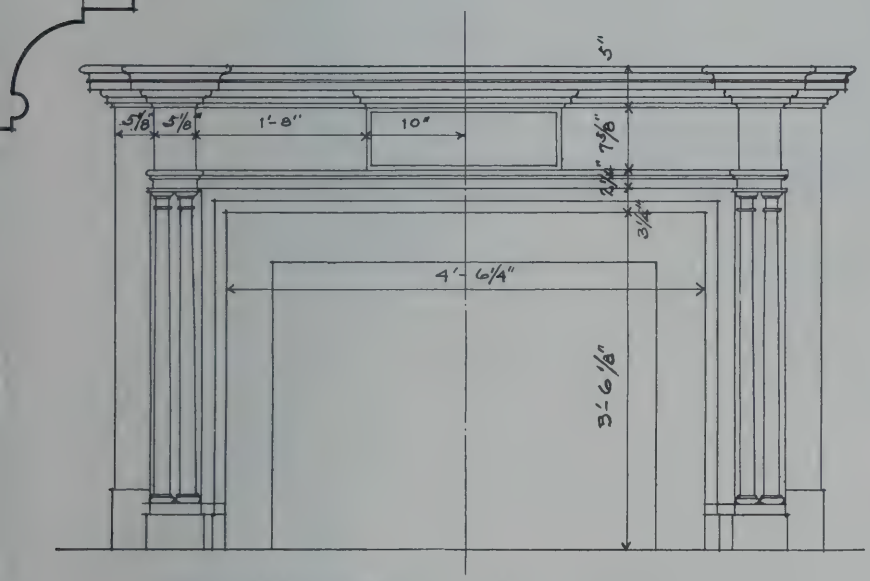


ARCH · IN · HALLWAY · BALTIMORE · MD ·
ABOUT · 1800 · ARCHITECT · UNKNOWN ·

MEASURED · & · DRAWN · BY ·
DIGGIN · BUCKLER

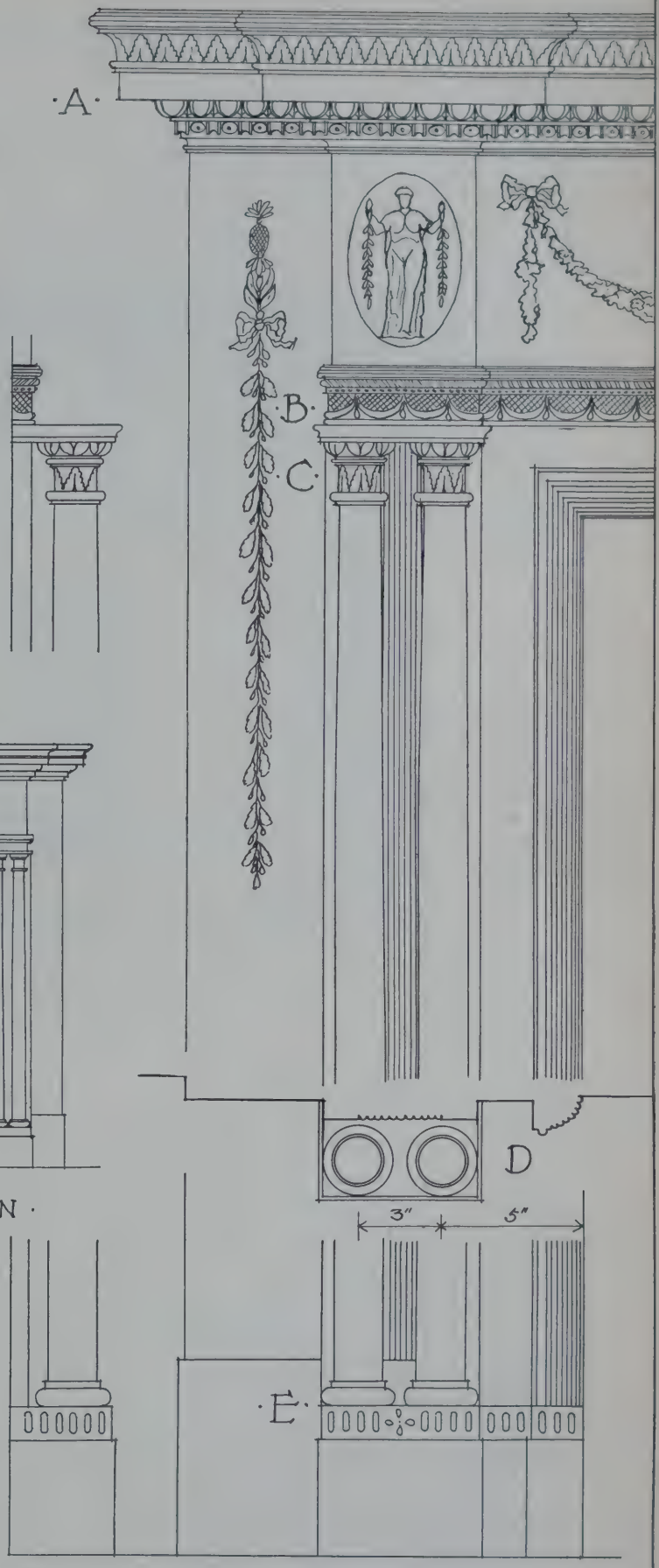


· FULL · SIZE · SECTIONS ·



· ONE · HALF · INCH · SCALE · ELEVATION ·

· CENTRE · PANEL ·



TWO · INCH · SCALE · DETAIL ·

· MANTEL · BALTIMORE · MD ·
· ABOUT · 1800 · · ARCHITECT · UNKNOWN ·

· MEASURED · & · DRAWN · BY ·
· RIGGIN · BUCKLEY ·

EARLY AMERICAN DETAILS

A SERIES OF MEASURED DRAWINGS

By RIGGIN BUCKLER

A MANTEL OF THE EARLY FEDERAL PERIOD

639 Columbia Avenue, Baltimore

CONSIDERABLE originality in the handling of design and much boldness of execution are seen in the interior architecture of this old house, which fronts what in colonial days was called the "Washington Post Road."

This mantel, while it is typical of the luxurious woodwork used in Maryland and Virginia about 1800, does not show that care and discrimination in the use of ornament which were general in the South, but much more likely to be seen in the restrained work of New England. What the mantel lacks in refinement of composition, however, is abundantly compensated for by its boldness and vigor and particularly by its adaptability to present-day use. This adaptability and the readiness with which the mantel could be reproduced will be better realized when one examines the measured drawing upon the reverse of this page, which shows the mantel without the ornament, which, to a critical mind at least, adds little if anything to its beauty.

Plate Description

Entrance Front of House of Alonzo Potter, Esq., Smithtown, New York

The House of John E. Deford, Esq., Baltimore, by Laurence Hall Fowler, Architect (Plates 52, 53), is a good illustration of the use of English Renaissance precedent in American design. Not only are the decorative details of this house successfully carried out in the Georgian style, but the brickwork has been given unusual thought and study. The walls, which are broken by niches, panels, string courses, and corner piers in a manner reminiscent of Wren's Queen Anne's Orangery at Kensington, show the variety of treatment possible in brick architecture when handled by a skilled designer who understands and appreciates the merits of his medium.

The House of Alonzo Potter, Esq., at Smithtown, N. Y., by Peabody, Wilson & Brown, Architects (Plates 54-56), is an excellent example of the adaptation of the Georgian style of English architecture to modern American country house requirements. This adaptation is particularly evident in the living and dining room bays on the garden side of the house, which definitely recall the design carried out by Sir Christopher Wren in the front bays of Groombridge Place, Kent, carefully studied in scale, and proportion and grouping of the windows.

Entrance Front of House of John E. Deford, Esq., Baltimore

EDITORIAL COMMENT

ARCHITECTURAL PRECEDENT

IN this issue of THE FORUM we present the first group of reproductions from the architectural photographs made in Europe last spring by our late Editor, Albert J. Mac Donald. As the principal purpose in taking these photographs was to provide the profession with specially selected illustrations of well and little known examples of architecture, which should serve as a source of inspiration and information, we have called the collection, "The Forum Studies of European Precedents." It would therefore seem fitting and appropriate at this time to briefly consider just what position precedent occupies in the present development of architectural design and the decorative arts.

This subject was brought to the active attention of the profession at the recent convention of the American Institute of Architects, where one session, under the leadership of H. Van Buren Magonigle, was devoted entirely to its discussion. It would be interesting to know what inspired Mr. Magonigle to choose as the subject of discussion, "Architectural Precedent," or as he phrased the title of his own discourse, "Plagiarism as a Fine Art." We wonder if he accidentally hit upon the tender spot in the profession's valuation of its creative ability, or whether he read with psychic intuition the subconscious mind of the man who would rather copy than originate. From whatever source his inspiration came, he at least succeeded in arousing far-reaching discussion and in stirring the profession out of its rut of complacent self-satisfaction. How great or how lasting may be the effect of this upon the future of architectural design in this country, no one can say; but its immediate effect is at least stimulating and salutary. It does us good to be suddenly brought up short and forced to think seriously upon a matter which underlies all architectural design today, quite as much as it did in the past.

So imbued are we with reverence for, and dependence upon, precedent through the training and instruction we receive in our schools of architecture, and through the inspiration we derive from contact with the great architecture of the past, is it surprising that we should show in our architectural expression the influence of precedent? It is not necessary for us to trace the influence of Greek architecture upon Roman design, or to follow the transition from the Classic styles, through Byzantine and Romanesque to the culminating glory of French Gothic in order to establish our premise that the intelligent use and innate appreciation of precedent are largely responsible for the gradual development of architectural design throughout the ages.

Are we following the line of least resistance in copying and adapting ancient and modern examples of architectural design in our work today? This is the question which Mr. Magonigle has led the profession to ask itself,—a question vitally interesting to the professional magazine, which strives to show on its pages illustrations and detail drawings of the best examples of the past as well as the finest work of the present, selected and determined by a deep sense of what may truly be considered as good architecture, good, not only because it meets the test of time, but also because it satisfies that greater arbiter, which knows no time,—good taste. Good taste, like right thinking, high principles and good manners, is a quality inborn rather than acquired. Good taste implies that which is proper, suitable and right. With good taste as the guide, the use of precedent must maintain a dominant influence in the future as it has in the past development of American architecture.

Examples are not lacking in America to show what may be done by architects to whom the following of precedent does not appeal, and there are not wanting, unfortunately, buildings which demonstrate the harm that may follow a breaking away from precedent and an abortive attempt to found a new architectural style. Such buildings, as has been proved, usually become wearisome to those who must live with them, and as time goes on through their freakishness they are likely to become abhorrent. How different is the case with countless buildings designed and planned in accordance with the principles which have been tried and proved by centuries of use! Then too, any conspicuous failure, particularly in the matter of design, brings incalculable injury to the cause of architecture. Unlike painting and sculpture, architecture has not as yet completely secured in the popular mind a foothold which fully establishes its place among the fine arts, and any bold disregard of the architectural proprieties, such as is almost inevitably involved in radical departures from established usage, injures the standing of architecture in public estimation.

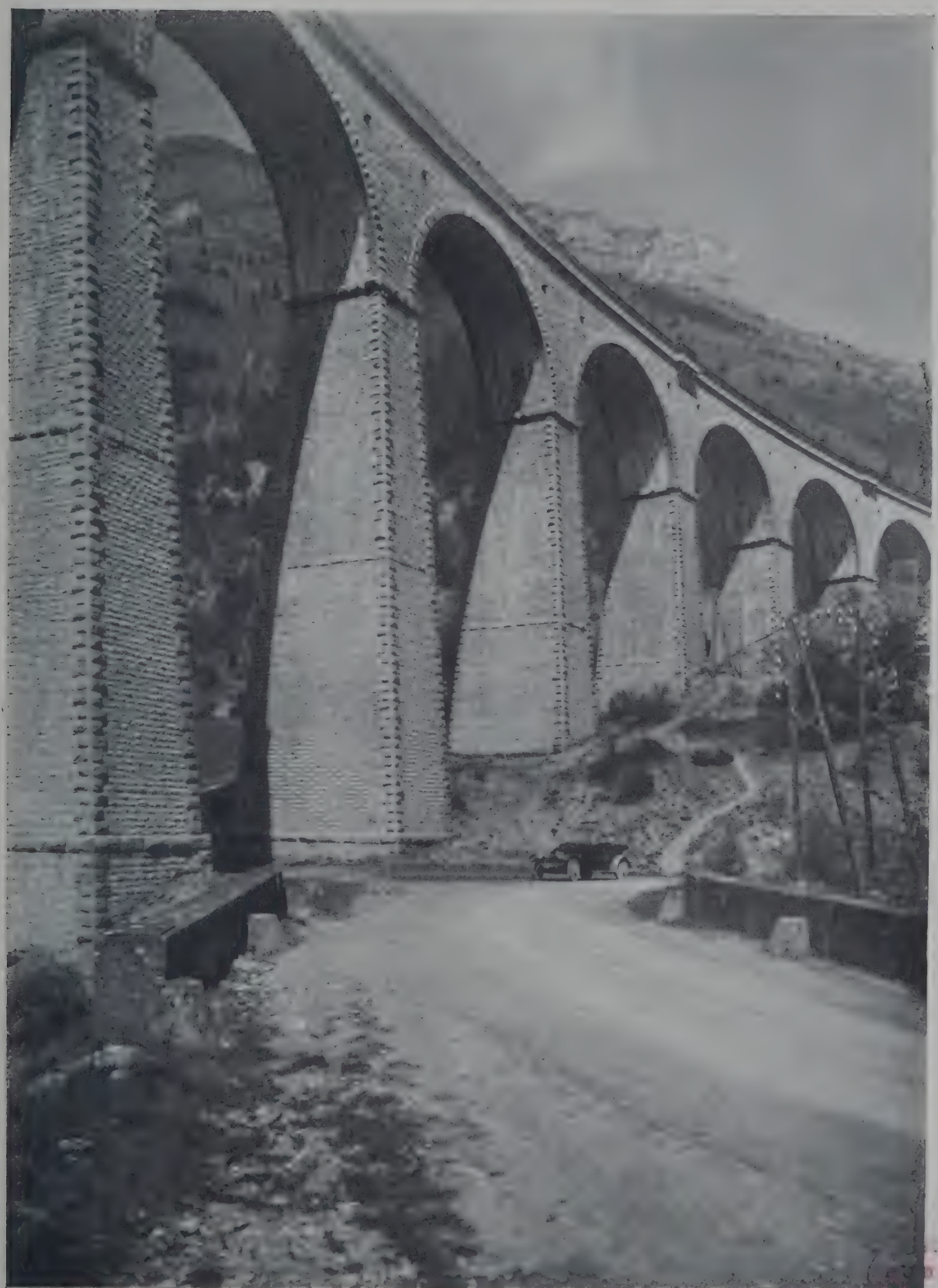
The best interests of modern architecture are served, we are convinced, by the wise and intelligent use of the splendid examples which have been bequeathed by the past to the present. Although the day for inventing or discovering new architectural styles has passed away, there still remains the opportunity of adapting existing precedents to present-day needs and uses. The willingness to perform this task, it seems to us, constitutes part of the duty which the profession owes to the public. Much is required of those to whom much is given, and the custodians of the world's architectural riches must render an account of their stewardship, a part of which is accounting for the use they have made of the opportunities which have been given them.

The Forum Studies of European Precedents

The Fraüen Kirche and Neptune Fountain
from the Hauptmarket,
Nuremberg

THE illustrations shown in the following plates are from a collection of nearly two thousand photographs taken early this year under the personal direction of Albert J. MacDonald, late Editor of The Architectural Forum. Accompanied by Paul J. Weber, the photographer of architecture, he undertook this pilgrimage through France, England, Italy and Germany for the specific purpose of making a collection of unusually artistic photographs, which would reveal the charm of little known architecture in the small towns and new beauties in many of the large buildings familiar to architects through travel and study. The trip, which was taken by automobile, made it possible to procure picturesque details hidden away in hill towns, along river roads, in the mountains, along the sea shore, as well as in the populous cities that are often the main sources of information for the architectural student.

These eight illustrations, showing the diversified character and wide range of the subjects, represent the first group of a series selected from this collection, which will be presented in the regular issues of The Architectural Forum during the next twelve months. Each group of pictures will cover some special architectural subject, such as Florentine loggias, Italian doorways, Renaissance windows, simple French interiors, and other subjects of interest and value to the architect. It is the hope and belief of the Editor of The Forum that these unusual photographs will serve as precedents in the designing of beautiful buildings, and as a source of architectural inspiration.



© *The Architectural Forum*

BRIDGE OVER THE DONNIER RIVER VALLEY ON THE ROAD FROM BOURG TO GENEVA

The Forum Studies of European Precedents; Plate 2

© *The Architectural Forum*

DETAIL OF COLONNADE AND FOUNTAINS, TEMPLE OF MUSIC, VERSAILLES

© *The Architectural Forum*

LIBRARY

DOORWAY OF THE RATHAUS, ROTHENBERG

© *The Architectural Forum*

NOTRE DAME FROM THE RIVER, PARIS

© *The Architectural Forum*

END PAVILION AND WALL OF THE STABLE COURT, FONTAINEBLEAU

The Forum Studies of European Precedents; Plate 6

© *The Architectural Forum*

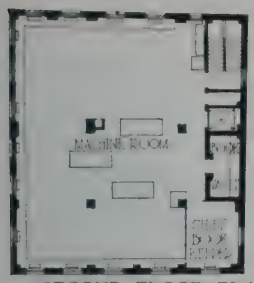
DETAIL OF LOGGIA, PALAZZO DORIA, GENOA

The Forum Studies of European Precedents; Plate 7

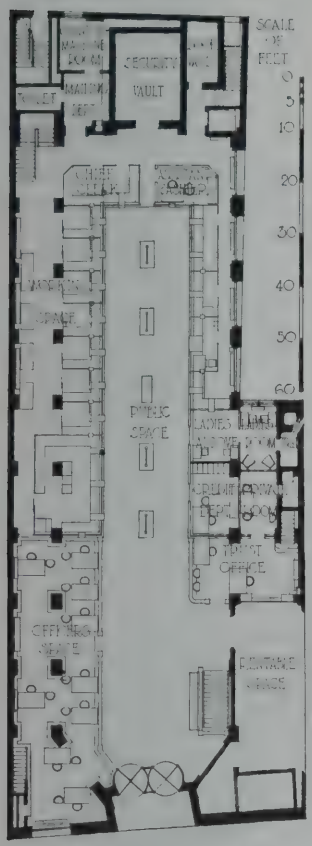
© *The Architectural Forum*

A BAROQUE GATEWAY IN NUREMBERG

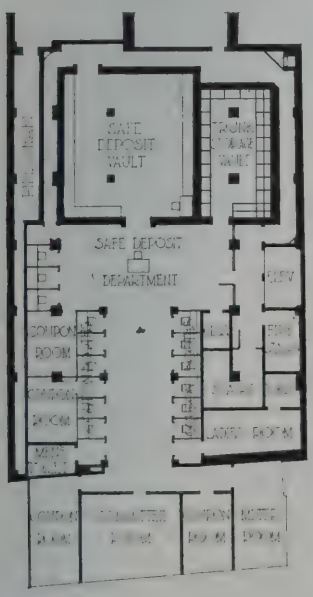
The Forum Studies of European Precedents; Plate 8



SECOND FLOOR PLAN



MAIN FLOOR PLAN



BASEMENT FLOOR PLAN

ITALIAN RENAISSANCE DETAILS CHARACTERIZE THE FRONT ELEVATION

THE PHOENIX NATIONAL BANK, HARTFORD

DENNISON & HIRONS, ARCHITECTS

EXTERIOR OF MAIN ENTRANCE SHOWING BRONZE GRILLES

THE MAIN ENTRANCE FROM WITHIN

THE PHOENIX NATIONAL BANK, HARTFORD

DENNISON & HIRONS, ARCHITECTS

Photos. Kenneth Clark

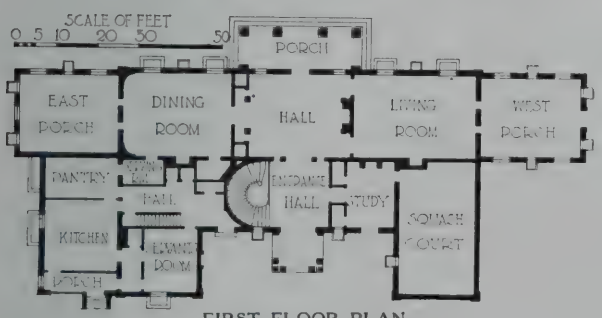
DETAIL SHOWING ARCADE WITH MEZZANINE BALCONY

ENLARGED EARLY MAP OF HARTFORD FORMS MURAL DECORATION

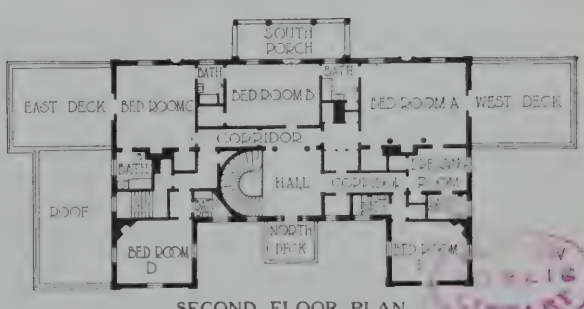
THE PHOENIX NATIONAL BANK, HARTFORD

DENNISON & HIRONS, ARCHITECTS

WEST PORCH AND GARDEN FRONT



FIRST FLOOR PLAN



SECOND FLOOR PLAN

HOUSE OF JOHN E. DEFORD, ESQ., BALTIMORE

LAURENCE HALL FOWLER, ARCHITECT

PUBLIC LIBRARY

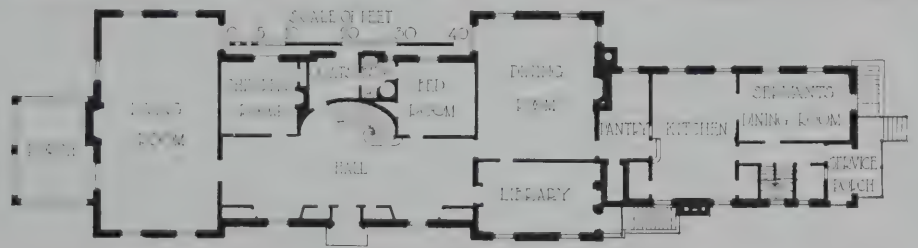
REFINEMENT OF DETAIL CHARACTERIZES THE ENTRANCE HALL

DETAILS FROM THE ADAM PERIOD ARE USED IN THE DINING ROOM

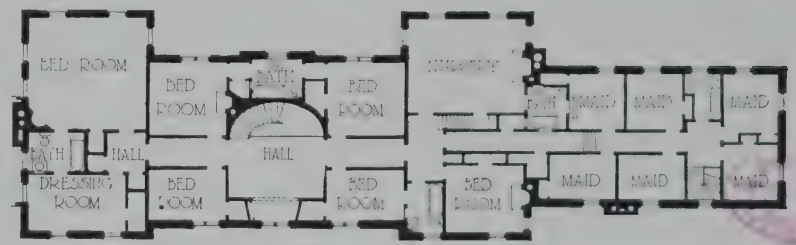
HOUSE OF JOHN E. DEFORD, ESQ., BALTIMORE

LAURENCE HALL FOWLER, ARCHITECT

GARDEN FRONT AND SERVICE WING



FIRST FLOOR PLAN

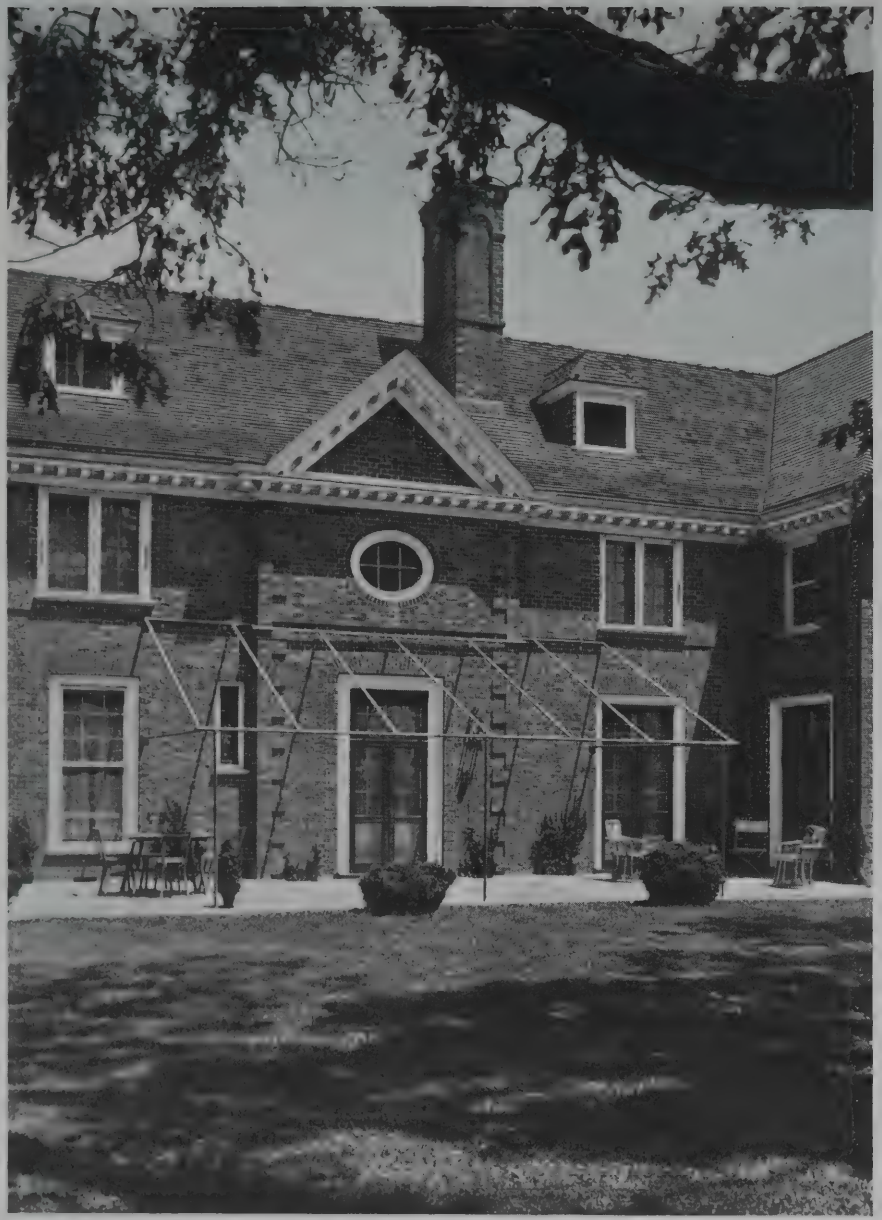


SECOND FLOOR PLAN

HOUSE OF ALONZO POTTER, ESQ., SMITHTOWN, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

Photos. John Wallace Gillies



GARDEN ENTRANCE AND TERRACE

DINING ROOM BAY AND SERVICE WALL

HOUSE OF ALONZO POTTER, ESQ., SMITHTOWN, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

ENTRANCE HALL AND STAIRWAY

ANTIQUE ITALIAN MANTELPIECE IN THE LIBRARY

HOUSE OF ALONZO POTTER, ESQ., SMITHTOWN, N. Y.

PEABODY, WILSON & BROWN, ARCHITECTS

F. A.

THE ARCHITECTURAL FORUM

NOVEMBER 1924

APARTMENT HOTEL REFERENCE NUMBER

PRICE $2

QVALITY LEAVES ITS IMPRINT

R-W Vanishing Door Hardware for the modern home.

Slidetite equipped garage doors slide and fold inside, well away from wind, ice and snow.

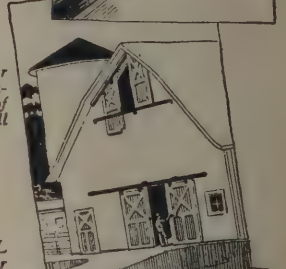
Perfect Performance from one year to the next

The test of time is the true measure of perfect performance in any door hanger. Through long periods of gruelling service, R-W Door Hangers have firmly established their superiority for ease of operation, permanence of adjustment, and genuine satisfaction.

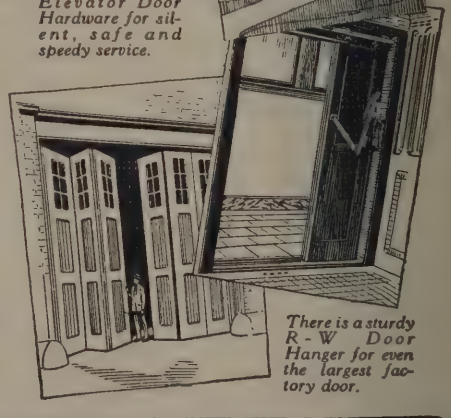
There is a type of R-W Door Hanger suitable for doors of every description. In addition to R-W Vanishing Door Hardware for the home, as illustrated above, we produce door hangers for use on elevators, on factories and on barns. The long-established leadership of these various types of hangers has made them the standard equipment of their kind.

Write today for information regarding R-W Vanishing Door Hardware, or for particulars of any other type of hangers in which you are interested. No matter what your door hanging problem may be, an inquiry addressed to Department F-28 will bring you the prompt assistance of our hanger specialists.

R-W Barn Door Hangers for durability and ease of operation in all weathers.



R-W IDEAL Elevator Door Hardware for silent, safe and speedy service.



There is a sturdy R-W Door Hanger for even the largest factory door.

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

A Hanger for any Door that Slides.

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(824)

FOUNTAIN IN THE WEST LOBBY OF THE BELMONT HOTEL, CHICAGO

FUGARD & KNAPP, ARCHITECTS; WARREN & WETMORE, CONSULTING ARCHITECTS

The Architectural Forum

BOOK DEPARTMENT

A Work on Old Spanish Architecture

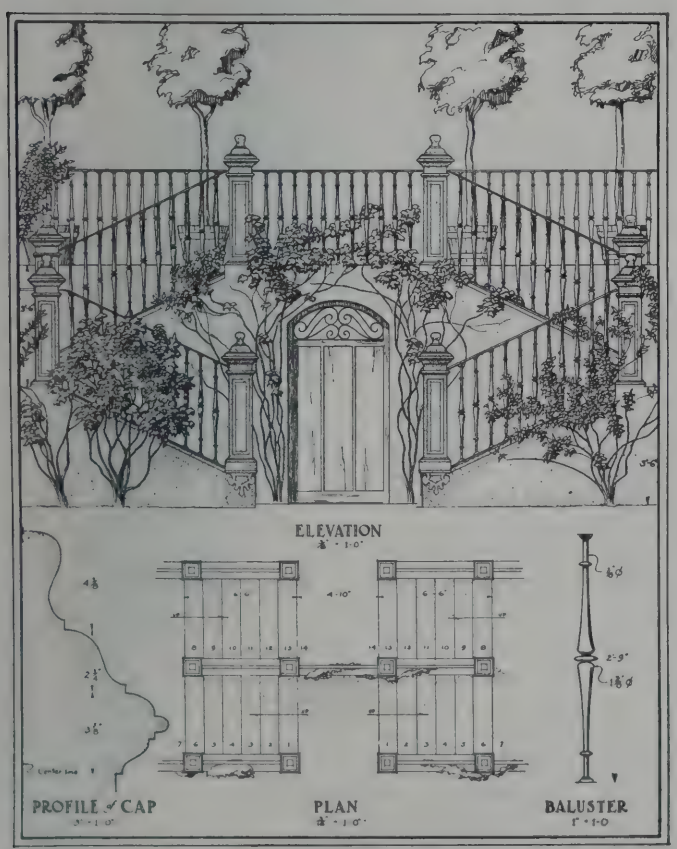
Reviewed by HORACE MORAN

SPANISH DETAILS. By William Lawrence Bottomley. Frontispiece in color; 104 plates and measured drawings, 11 x 13¾ ins. In portfolio form, $12.50; bound, $15. William Helburn, Inc., 418 Madison Avenue, New York.

IT is said that the jewels of Isabella of Spain once made possible the discovery of America, and now more than four centuries later the wealth of our land is bringing about the discovery of Spain. These two countries enjoy somewhat the same brilliant atmosphere, some of our states, such as California and Florida, having also the high summer temperature of the Iberian peninsula, and this common heritage would seem to suggest a resulting similar architecture. It occurs to us, therefore, that we may be using questionable judgment in continuing universal use of the stolid and relatively gross and drab architecture and color of the dreary Northern countries of Europe. Perhaps the present rediscovering of Spain, coupled with our success in the use of cement, may tend to sway our coming Renaissance toward an architecture more suited to those parts of America where the climate resembles that of Spain.

The recent awakening of interest in the arts of Older Spain has resulted in some excellent work in this country, but the pace of the demand has been too rapid; our architects frequently show how little they know of that naïve spirit which is responsible for true Spanish design. A few years ago there were almost no publications on Spanish work for the use of the architect or designer in the crafts. Today the research work of Arthur Byne and Mildred Stapley Byne, who live in Spain, has given us several most learned folios on ironwork, furniture, interiors and gardens, and the versatile pen of Ralph Adams Cram has contributed appreciative and valuable notes on the architecture of Spain, recently presented in one of the architectural publications. There are also several folios published in Spain, and at least two in Germany, and a few from other sources.

Many more volumes are needed to cover the wonders of this fertile land of design, and it is a pleasure to welcome the latest contribution, the collection of choice bits of design gathered throughout Spain by William Lawrence Bottomley, and well presented in his "Spanish Details." This volume gives glimpses of interesting motifs grouped so as to be of use when studying the characteristic features of the exteriors and interiors of Spanish houses as well as the never-failing bit of garden or patio. 'Tis a pity such a volume cannot convey an



Working Drawing and Illustration of a Stairway in Seville. From "Spanish Details"

appreciation of the color which plays so fine a part in Spanish architecture, even in the stucco walls. Who, having never seen it, could grasp, for example, the beauty of the golden and siena buildings of Segovia as seen through the deep green foliage and on a background of deep blue sky? Such a work as this by Bottomley and the volumes by the Bynes, to name only a few of the recent works on Spain, should be supplemented by a visit to Spain if the wealth of material they set forth is to be used for creative work in America.

It is interesting to follow our author through Spain as we turn over the plates and trace his quest for the best things to illustrate, and we appreciate how he must have felt the restraint of confining his effort to one volume in exploiting a land so rich in architectural detail. Even Mallorca, an island province of Spain, has been included, though worthy of a volume of its own!

The wise omission of pure Moorish work we note with satisfaction, for it is not that we wish from Spain, but rather the later quaint Moorish motifs and craftsmanship, absorbed but ever evident in the dominating note of early Renaissance design and known to Spaniards as "Mudejar." The numerous scale drawings accompanying the plates would have been of more constructive service if the author had stressed details of construction and contours, with more notes as to materials and colors. Perhaps we would have preferred the pencil notes from his sketch books, from which he has with much labor worked up the plates of scale drawings. We venture to suggest also that a sharper focusing of the camera would have resulted in less diffusion of detail in the process of enlargement and reproduction. Our thanks are due Mr. Bottomley for presenting to his fellow practitioners and an interested public this fruit of his studies in Spain, and in so highly attractive a form.

REINFORCED CONCRETE AND MASONRY STRUCTURES. Compiled by a Staff of 16 Specialists. Editors in Chief: George A. Hool and W. S. Kinne, 786 pp., 6 x 9 ins. Price $6. McGraw-Hill Book Co., Inc., New York.

WITH the use of concrete now practically universal for building of the most widely different kinds it is of course vitally necessary that the nature of the material and its proper handling be well understood by architects, engineers and the workmen who actually deal with it. Perhaps the simplest of all the countless uses to which concrete is put is the building of foundations for residences; from this its use extends, when strengthened by steel reinforcing, to building bridges, dams and hydraulic structures of different kinds and for large buildings, much of which is work of great magnitude, where problems of considerable importance must be solved.

This constant use of concrete, particularly of reinforced concrete, has developed such familiarity with the material on the part of several who have used it extensively, that it is possible to formulate certain rules which are calculated to increase concrete's usefulness by making its possibilities thoroughly understood. In this volume, which is one of a series of manuals edited by Messrs. Hool and Kinne which have been appearing during the past few years, the subject of concrete is thoroughly dealt with. Beginning with "Preparation of Concrete," it follows the subject through "The Transporting and Placing of Concrete," "Forms," "Bending and Placing Reinforcement," "Surface Finishing and Waterproofing" "Retaining Walls" and "Chimneys," while perhaps the section which will most interest many architects, engineers and contractors who work in concrete is that which discusses "Estimating Concrete Costs." In various appendices consideration is given such subjects as "Standard Specifications for Portland Cement," "Specifications for Concrete Reinforcing Bars," and "Standard Methods of Testing for Impurities," and besides numerous diagrams and tables which are calculated to aid the concrete worker there is given a comprehensive index which adds much to the book's helpfulness. The work stands for the best practice which has been reached in the use of reinforced concrete.

THE EIGHTEENTH CENTURY ARCHITECTURE OF BRISTOL. C. F. W. Dening, F.R.I.B.A. 191 pp., 10¼ x 12½ ins. Price $12. J. W. Arrowsmith, Ltd., 6 Upper Bedford Place, London.

EXAMPLES of the graceful and urbane Classical architecture which characterized the eighteenth century in England are by no means confined to London. During a great part of the Georgian era, and indeed earlier, Bath was perhaps the chief rendezvous of English fashion, and under the leadership of the Woods, father and son, there grew up a marvelous architecture; and the preservation practically intact of Bath, so that it retains its old time atmosphere as well as its architecture, is a cause for thankfulness. During much of the same period Bristol reached and maintained a high level of prosperity, and riches together with the luxury which riches foster summoned thither architects and builders who filled the old town with fine examples of what English architects were doing in the eighteenth century. The English genius is not imitative but studious, intuitive and absorbing. In architecture the English studied and assimilated the fashions of the antique world as well as of modern Europe, but transformed, adapted or blended, expressing in terms thoroughly English a type of architecture which proves that vitality and reserve can be made to go together, and that strength and delicacy are by no means irreconcilable.

While not as fortunate as Bath, Bristol is still filled with the mellow old buildings which eighteenth century architects knew so well how to dispose around crescents, squares, places and circles,—old houses generally of brick with stone dressings, substantial without being palatial. Their brick and stone have all the subtle interest of color and texture which comes from careful, loving workmanship, and along with care and skill in the designing and construction of buildings went equal skill and care in the fashioning of such details as paneling, stairways, shutters, keystones, the graceful "hoods" and fanlights of doors, scrapers and knockers. Could anything surpass these for quiet distinction, for aloofness, reticence and withal abiding and enduring charm?

This volume illustrates and describes much of the architecture of old Bristol, and it is particularly useful to the present-day architect in that by far the greater part of the buildings described are residences not of the grandly palatial order but of a kind which would be appropriate for use almost anywhere today. Illustrations of exteriors and interiors are accompanied by quite a number of working drawings of stairways, hooded doorways, etc., and many details of different kinds.

BRIDGMAN'S LIFE DRAWING. By George B. Bridgman. 169 pp., 7 x 10 ins. Price $5.50. E. C. Bridgman, Pelham, N. Y.

SKETCHING, of course, plays an important part in the work of almost every department of art. It is of the first importance in painting and occupies a place almost as vital in sculpture, while in architecture the value of sketching or drawing is, of course, apparent and evident, and it must be mastered by the student who would excel in any of these branches of art. Many of the great masters of architecture as well as the most eminent among the painters of past centuries have left to the modern world many of their sketches, which prove their achievements, whether as painters or architects, to have been built upon a strong and sure foundation as masters of drawing.

While sketching of all kinds possesses certain attributes in common, the very extent of the subject presupposes its being divided into many different classes, two of which are sketching as applied to anatomy, dealing with the human figure, and sketching of buildings as applied to architecture. This volume devoted to sketching as applied to the human form is by an instructor and lecturer at the Art Students' League, New York, who is also author of "The Book of a Hundred Hands" and "Constructive Anatomy." This most recent of his published works on drawing is the result of long experience as a lecturer and an instructor and deals with the drawing of the blocked human form, where the bending, twisting or turning of volume gives the sensation of movement held together by rhythm, its purpose being to awaken a sense of research or analysis of the structure.

Something of the closeness of the parallels between anatomical and architectural drawing might be indicated by certain of the volume's chapter headings: Drawing the Figure, Building the Figure, Balance, Rhythm, Distribution of Mass, Light and Shade, Mouldings, Proportion, How to Measure, all this being applied to different aspects of anatomical sketching, but holding much to interest the student of drawing of an architectural nature.

As regards mouldings: "Architectural mouldings consist of alternate rounds and hollows, of plane or curved surfaces, placed one beneath the other to give various decorative effects by means of light and shade. The human figure, whether standing erect or bent, is composed of a few big, simple masses that in outline are not unlike the astragal, ogee, and opophyge mouldings used in architecture. Looking at the back of the figure, there is the concave sweep of the mass from head to neck, then an outward sweep to the shoulders, a double curve from rib cage to pelvis, ending abruptly where the thigh begins, a slight undulation halfway down to the knee, a flattened surface where it enters the back of the knee, another outward sweep over the calf and down to the heel, the whole a series of undulating, varied forms. And the front of the figure curves in and out in much the same manner, a series of concave and convex curves, and planes. The distribution of light and shade brings out these forms."

The work, carefully and thoughtfully written as it is and fully illustrated with reproductions from sketches of every part of the human frame, constitutes an important contribution to the broad subject of drawing.

OLD ENGLISH WALNUT AND LACQUER

By **R. W. SYMONDS**

QUITE as important in many types of architecture as interior design is the planning of furniture which goes with it. For each of the historic styles there were designed accessories which by being in agreement and harmony with their surroundings aided in creating the effect which the type made possible, easily marred by use of furniture unsuited to the surroundings.

With the architecture of no country or period was there used furniture more beautiful and distinguished than in England during the late Stuart and the early Georgian eras. Attracted by economic opportunities, the most skillful designers in Europe planned furniture which was built by the most finished of craftsmen. This was the "Walnut Age," during which were made masterpieces in walnut, and intercourse with the East brought the use of lacquer, also fashionable, and imitated presently by English workmen.

WRITTEN by one of the foremost students of English furniture, this work covers fully and completely the subject with which it deals. The design of furniture, its structure and its ornament, whether carved, inlaid or lacquered, its finish, and the care which furniture should receive are fully discussed, and there is given advice as to the identifying of old pieces and the detection of modern copies of old English furniture often sold as old to the unwary.

Intended for the furniture maker almost as much as for the designer, student or collector, the volume contains diagrams showing the details of joining, varieties of inlay, types of stretchers and spirals, and perhaps the most valuable feature of the work is the large number of excellent illustrations showing furniture of all the different kinds—bureaux, tables, chairs, stools, settees, cabinets and clocks developed in walnut or lacquer.

Fully Illustrated, 176 Pages, 9x11 Inches, Price $8.75

ROGERS & MANSON COMPANY, 383 Madison Avenue, New York

Tyler "Noiseless" Installations in ELEVATOR ENTRANCES

THE ALCAZAR
Cleveland
H. T. Jeffery, Arch.
Tyler Elevator Entrances

SILENT, smooth-operating elevators are a valuable asset in apartment hotels. Here relaxation is sought from the hustle and bustle of business, and noisy elevator doors are doubly irritating. Rooms adjoining such elevators are difficult to rent or lease—even at a reduced rate.

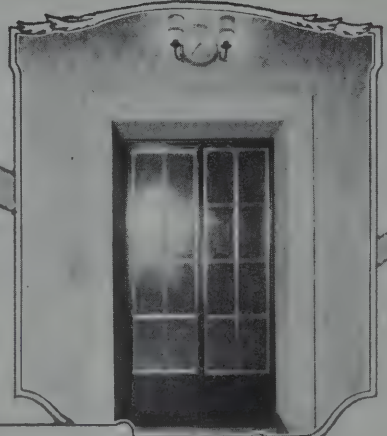
Tyler "Noiseless" Elevator Entrances and Cars are an investment in smooth, silent operation—in pleased tenants and guests—in maximum rental values.

In design, color, and architectural treatment also, Tyler Equipment contributes to the restful harmony and attractiveness of the interior. The grain and color of the finest woods can be reproduced—

THE W. S. TYLER COMPANY

68 Devonshire Street BOSTON
247 Park Avenue NEW YORK

FENWAY HALL
Cleveland
Geo. B. Post & Sons, Archts.
Tyler Elevator Entrances



BOLTON SQUARE HOTEL
Cleveland
Reynold H. Hinsdale, Arch.

ELEVATOR ENTRANCES - ELEVATOR CARS
TYLER
TRADE MARK REGISTERED
CLEVELAND

THE EDITOR'S FORUM

LECTURES AT THE METROPOLITAN

AS part of the exercises attending the opening of the Wing of American Decorative Arts, given by Mr. and Mrs. Robert W. de Forest, there have been announced two courses of lectures. The first series of eight lectures, to be given on Mondays, from November 17 to January 4 in the Lecture Hall, will seek to present a general view of the various phases of art which are exemplified in the collections of the new wing. The second series of seven talks, to be given on the Tuesdays following, November 18 to December 30, in the galleries of the wing itself, will take up in a less formal manner the objects exhibited, under the same general headings as those adopted for the first course.

Attention is called to two lectures to be given by Herbert Cescinsky on March 15 and 22, 1925, at four o'clock, upon The Influence of Architecture on English Furniture and The Minor Craftsmen in English Furniture.

EXHIBITION IN MONTREAL

UNDER the auspices of the Province of Quebec Architects' Association there will be held at the galleries of the Art Association of Montreal, from November 12 to 24, an exhibition of old French architecture in Quebec, consisting of photographs, measured drawings and sketches of buildings which have been demolished as well as of those still existing. The School of Architecture of McGill University will contribute an exhibit of surveys of old buildings made by its students, and holders of the Province of Quebec Studentships for the past 15 years will have their work on view, while the David Ross McCord National Museum, which has a rich and varied collection of drawings of old French buildings, has signified its willingness to contribute.

It is the hope of the promoters of this exhibition to raise sufficient funds to publish the first volume of a work of surveys and photographs of old French architecture in Canada, the beauty of which attracted attention at the British Empire Exhibition.

HOUSE BEAUTIFUL COVER COMPETITION

THE success of the cover competitions held the last two years has led the *House Beautiful* to repeat this event and again to offer two prizes, one of $500 and one of $250, to successful contestants. A number of honorable mentions will also be given. The competition will be closed February 7, 1925. Full particulars regarding the competition may be had on application from the Competition Committee, The *House Beautiful,* 8 Arlington Street, Boston.

ELECTRIC POWER CLUB HANDBOOK

THE Electric Power Club, Kirby Building, Cleveland, has recently issued the 14th edition of its handbook, which covers substantially all the standardization which has been effected in America of the manufacturing of electric motors, motor pulleys, generators, transformers, electric tools, mining and industrial locomotives, control equipment, power switchboards, and switching equipment. One detail of the work which increases its helpfulness is the inclusion of definitions, data regarding symbols and considerable general engineering information.

DETROIT AND CHICAGO EXHIBITIONS

THE Thumb Tack Club, the exhibitions of which are always of interest, will hold its Fourth Annual Architectural Exhibition at the Detroit Museum of Arts, November 17 to 30 inclusive. Plans for the 1925 exhibit of the Chicago Architectural Exhibition League are now well under way, the exhibit having been announced for opening in February in the East Wing of the Art Institute; the items will be sent later to the National Exhibition to be held at the Grand Central Palace in New York.

Details regarding the Detroit exhibition may be had of Clair W. Ditchy, 324 Kerchey Building; information concerning the Chicago exhibition may be had of Pierre Blouke, 721 No. Michigan Avenue.

RESULTS OF A COMPETITION

JUDGES in the contest conducted by *Country Life* for the best design for a country home for a man of moderate means have recently announced these awards:

First Prize, Alfred Cookman Cass, Philadelphia.

First Honorable Mention, Henry A. Cook, New York.

Second Honorable Mention, John Floyd Yewell, New York.

Third Honorable Mention, H. Ross Wiggs, New York.

In addition to these, for general excellence of design and plan, 12 more were favorably mentioned. These were:

Leslie W. Devereux, Utica; C. W. Lemmon and F. H. Stanton, Los Angeles; I. Pendlebury, Owen L. Gowman, Charles Kenneth Clinton and William Rankin, Polhemus & Coffin, Francis Keally, William Adams Delano, New York; Richard I. Brumbaugh, Denison, Texas; Alfred F. Schimek, Chicago; D. M. Allison and R. O. Dorwin, Cleveland; Michael J. Hoffman, Jr., Buffalo.

The judges of the competition were John Russell Pope, Alexander B. Trowbridge and Reginald T. Townsend, the latter Editor of *Country Life.*

Photo. Drix Duryea

Lobby Side of Entrance Vestibule

Service Facilities. In planning the apartment suites at Park Lane the idea was to provide tenants with all the service and freedom from responsibility that characterize a well managed hotel, but at the same time to make it possible for them to have, if they wish, the privacy of their own apartments. Each apartment in Park Lane, therefore, includes an ample service pantry, with refrigerator, warming oven, sink and china closet, with which equipment food prepared in the main kitchen is easily and perfectly served. A constant change of air in every pantry is insured by mechanically operated vents, and care was taken in locating the pantries so that the waiters do not pass through the apartments in order to bring in and prepare the food. On each floor of Park Lane there is a large service hall, centrally located to make the distance from it to every apartment as short as possible, with the factor of speed further aided by three high speed service elevators running directly from the main kitchen to the service halls on every floor. For those tenants of Park Lane who retain personal servants, the larger apartments provide maids' rooms, and each floor has also several additional maids' rooms.

The Average Demand for Rooms and Arrangement. The greater demand, in apartment accommodations, appears to be for the smaller units, of from two to three rooms, each comprising a fairly large living room and one or two bedrooms. In buildings of the Park Lane type the living rooms should be from 12 feet, 6 inches wide and from 20 to 30 feet long, a good average size being 14 by 27, with bedrooms 14 by 19, or 12 feet, 6 inches by 18 feet.

In small-unit apartments it may be noted that the device of the disappearing bed has recently become very popular. Where space is limited and it is desired to make every square foot pay, the large living room, with the bed-closet and a bath, can be called a "two-room apartment." When the disappearing bed is used, whether it is required by law or not, the closet in which it is concealed should be artificially ventilated in order to keep bedding aired.

Although the greatest demand is for the smaller apartments, each floor should be planned with a few larger suites to provide for larger families who would require all the accommodations of a home, such as a private foyer, living room, dining room and two bedrooms, increased to three if necessary, and a maid's room. In addition to this typical apartment unit, the Park Lane apartments also include boudoirs or dressing rooms; this has proved a very attractive feature, and one which has been shown to have a strong appeal to women. The well designed apartment unit has ample closet space, as at the Park Lane, where the main closet, with an outside window, is large enough to store a trunk in, with enough spare space to walk around it. In estimating the proper size for a closet, provision should be made for about 20 suits or dresses, and at Park Lane the closets also have boot-shelves.

The duplex apartment idea, which became popular in New York 12 or 15 years ago, has always been identified more with buildings of the apartment house type, and is very seldom the basis of apartment hotel planning, with which it rarely agrees.

Photo. Amemiya

Screen in Dull Gold and Polychrome Shuts Off Ballroom Suite

The Typical Floor Plan. Modern apartment planning has abandoned the old "long hall" type of plan, in which all the rooms opened off a long, narrow corridor, in favor of the "foyer" type of plan, in which the rooms are arranged to open all from a foyer hall. The larger apartment units, on the foyer plan, should be placed at the ends of the wings, and the other apartments, entered from the elevator halls, should also have each its own private foyer, no matter how small, in order to give a separate entrance to each room, and to avoid the bad arrangement of the long communicating hall or the even worse arrangement by which one room is entered through another, the "railroad" type of plan.

The number of elevators required for a building has never been reduced to a standard formula, because the determining factors are variants, such as the height of the building in stories, the number of apartments per floor, and the type of patronage for which the house is built. In a building like Park Lane, where no peak of traffic on elevators can be claimed, allowance was made for one elevator for every 150 rooms, not including the maids' rooms and boudoirs. The number of stairways and their location in relation to elevator shafts are fixed by the requirements of law, as they come under the fire-safety provisions. In case of an emergency it is good planning to provide at least one stairway, located as remotely as possible from the elevators, thus affording two distinctly separate means of exit. For the apartment hotel which is operated as a hotel, the elevators are best placed in one group,

Photo. Drix Duryea

Ornamental Colonnettes Enrich the Windows of Dining Room

Photo. Drix Duryea

Dining Room Entrance

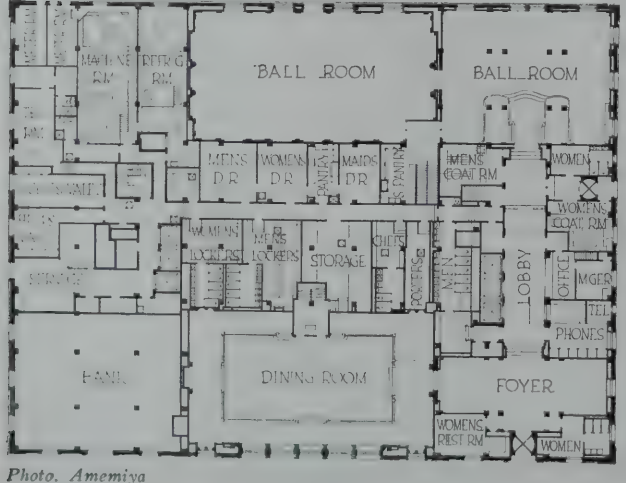
which tends to simplify the plan of the main floor.

The elevator equipment should include two service elevators, one detailed for freight and the other for service. As quick service of food to the apartments is essential, the service elevator should be placed as close to the kitchen as possible, and if space is so limited as to make only one service elevator possible, the risky combination of freight and service in one is best avoided by installing fast dumbwaiters. The advantage of a service elevator over a dumbwaiter, however, is so great as to make it worth while to provide for it unless it is absolutely impossible. Time in sending meals up from the kitchen is a factor of the utmost importance, and efficient service demands that the waiter should stay with the order he is serving, thus avoiding the delay usually resulting from dumbwaiter service, as well as the necessity for double handling.

With due regard to location close to the kitchen, the service elevators should be placed as centrally as possible on the typical floor plan. An inside corner, off the main corridor, is a good location, as it utilizes a dark place. The main kitchen should be relieved of considerable room service detail by the provision of service elevator halls on each floor, equipped with ice chests, china closets, linen and other necessaries. In Park Lane the pantries included in each apartment unit make it possible for the tenants to use their own silver, linen and china, if they wish to do so.

The necessities of the modern hotel or apartment house find ample use for the dark spaces which

THE ADAM STYLE OF ENGLISH ARCHITECTURE IS SUGGESTED IN DESIGN OF DECORATIVE DETAILS



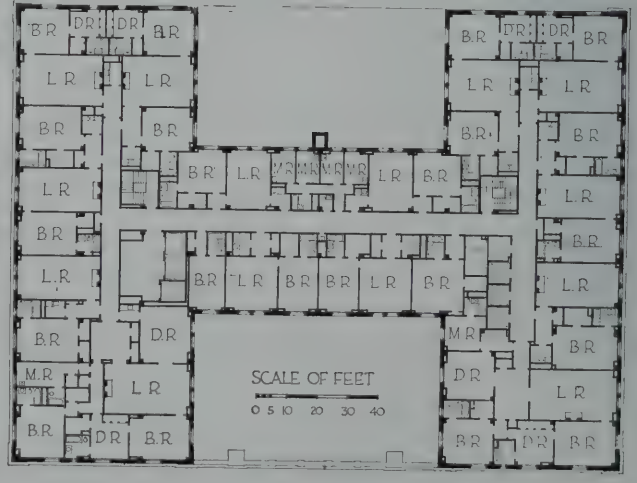


Photo. Amemiya

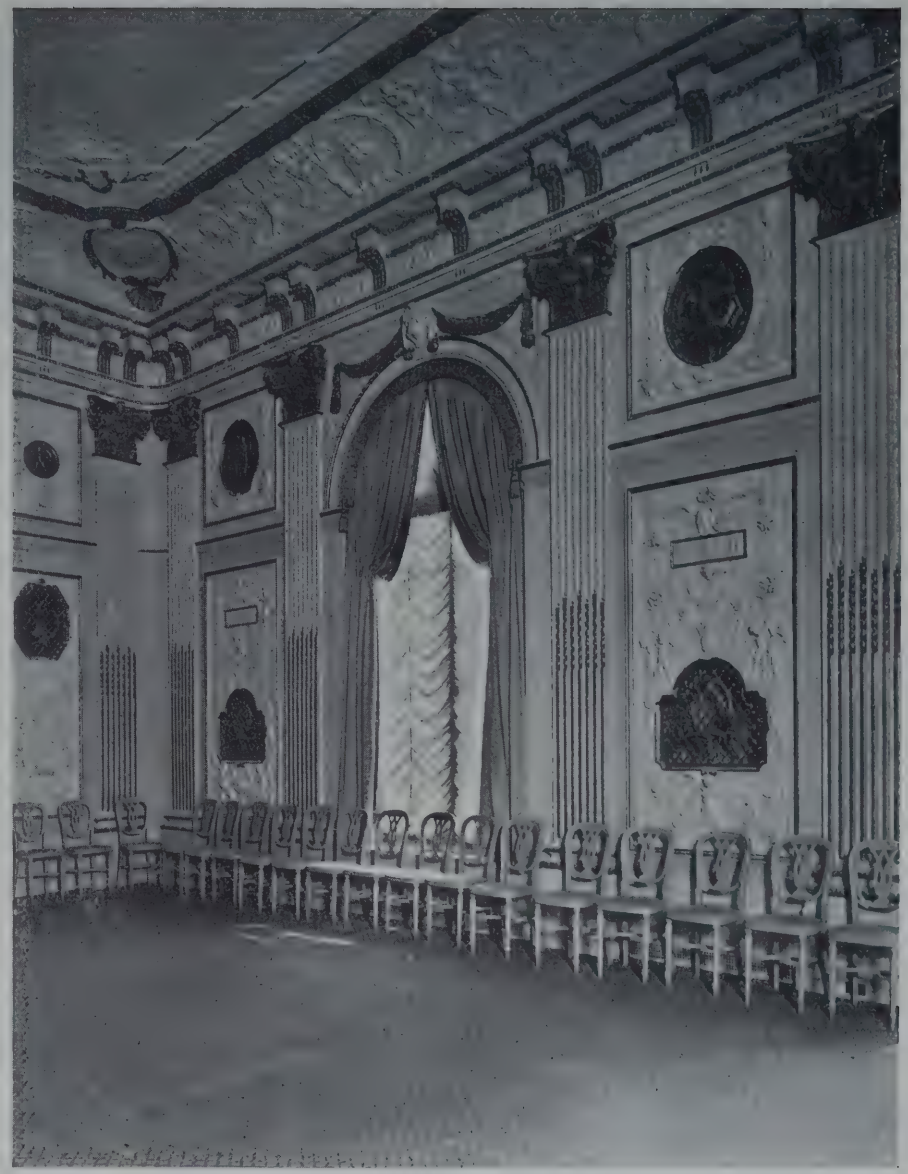
GROUND FLOOR PLAN TYPICAL FLOOR PLAN

THE PARK LANE HOTEL, NEW YORK

SCHULTZE & WEAVER, ARCHITECTS

Photo, Amemiya

POLYCHROMED CEILING AND RICH RUGS GIVE WARMTH TO THE LOBBY



DETAIL OF THE BALLROOM, SHOWING USE OF GOLD IN THE DECORATIONS

THE PARK LANE HOTEL, NEW YORK

SCHULTZE & WEAVER, ARCHITECTS

of any hotel or apartment house kitchen depends on the space required to install the standard hotel kitchen equipment necessary to handle the cooking required by the maximum number of persons to be served. Store rooms, refrigerators and refrigerated food storage rooms are located off the kitchen. Provision should be made for employes, so that every servant will have a place to change into uniform before going on duty, and all necessary toilet facilities as well as a servants' dining room should be included in the plan. It has been found that the interests of economy and efficiency are best served by keeping employes in the building rather than giving meal allowances, which entails extra detail in checking in and out.

If space is too limited to allow the inclusion in the plans of a large laundry for the entire house, a small laundry should be provided to allow the tenants' maids to do light washing of pieces which it might not be wished to entrust to outside laundries. In the dark spaces on the lower floors, there should be ample storage rooms, both large and small, for chairs, awnings, furniture, trunks and other things which at various times and various seasons of the year are to be put away on the premises.

As a convenience to guests it is well to consider provision in the plans for such services as barber shop, humidor, valet service, telegraph office, flower shop and news stand, the operation of which, whether direct or by letting them as concessions, is of course optional with the management. In an apartment hotel of the type represented by Park Lane, the less such features are in evidence the better, because it is highly desirable to secure as much privacy and exclusiveness as possible in the atmosphere of the entrance hall.

Apartment Hotel or Hotel Apartment? In planning Park Lane certain considerations other than those purely architectural entered into the planning. It was the intention of the management to impart to Park Lane a sense of permanent rather than transient residence, to make it an apartment dwelling with hotel service rather than a hotel with apartments to lease. The distinction may seem unnecessarily fine, but it was endeavored to express in the architecture of Park Lane this intention on the part of the management, and to create an apartment building which would set a new model, as a variant from the typical, in the field of apartment hotels.

With the distinctions now being made as between various types of apartments, each apartment house building offers a problem in itself, and in developing the plans the architect works out a number of different schemes, from which he eliminates those which do not meet the requirements. The final plan is then demonstrably the best to execute. The metropolitan apartment, operated on whatever system of rental or ownership, has become a highly specialized architectural type, developed today in the direction of conservative good taste in the matter of style and the utmost provision for comfort and convenience in its service and living accommodations.

Photo. Drix Duryea

The Exterior of the Dining Room Is Indicated by an Arcade Enriched with Marble Colonnettes and a Richly Carved Frieze

Economic Factors of An Apartment Hotel Project

THOSE who are considering the development of an apartment hotel project face a number of important business problems which directly affect the selection of location, the financing, and the planning and equipment of the proposed building.* These considerations bear primarily on the investment required, the gross income which may be expected, and the various expenses of operation, maintenance and depreciation which must be carefully considered and controlled in order to establish a net income commensurate with the financial risk involved. To indicate and describe in one article all the important elements involved in the economic considerations of a project of this nature is impossible, but in order to present many of these elements in a manner which will insure their careful consideration a classified tabulation has been worked out and will be found on the following two pages. In this tabulation there are four main divisions, each subdivided into logical groups of suggestions.

One chart (No. 1) outlines a number of factors influencing the selection of the site for an apartment hotel. This is divided into a consideration of local conditions of the proposed site, physical conditions of the land, conditions which affect appraisals, underlying conditions of the rental market, and some miscellaneous suggestions. Certain of the points briefly indicated will bear further explanation, while others are self-explanatory. The local conditions outlined represent the general demand on the part of the type of tenants who might logically be expected to live in an apartment hotel, so the requirements listed under this heading call for community facilities and physical characteristics of the neighborhood which will meet a clearly defined potential market. Under physical conditions, as indicated in the chart, experience has shown that the site should be chosen facing a park or a wide boulevard or at least be a corner lot so that permanent light and air are assured. If such a location is not available, an extra lot should be purchased adjoining the building on each side and maintained with low buildings to provide light and air. The orientation to insure sunlight, proper ventilation and good exposures is highly important. Another viewpoint from which the site should be considered is that of the mortgage loaning interests, which will appreciate the location and proposed building and will make decisions in regard to the financing in accordance with their liking for the location and their belief in its future. It is perhaps needless to emphasize the importance of a most thorough analysis of the rental market. For a project of this nature the demand should already be in existence, because pioneering in a torpid rental market is a long and expensive procedure. Local rentals or at least rentals in a similar district must justify the investment. The best opinion advises omitting retail stores and shops unless they are absolutely necessary to help carry the high overhead of expensive real estate. Tenants in the apartment hotel think of the building as a home, and they are not favorably impressed with the intrusion of retail business, which generally destroys domestic character.

The restaurant offers an involved economic problem for which few apartment hotel owners have found a happy solution. A restaurant is a necessary detail, but in order to show any profit or even to pay its own way it must draw outside patronage in some manner. Hence the development of tea rooms and coffee shops as described in the article on "Food Service in Apartment Hotels" in this issue. In view of the fact that profits from the restaurant are questionable, this service should be analyzed carefully and space and equipment selected and arranged for economy of space and in a way calculated to attract outside patronage. Other interesting details which should be carefully considered will be found indicated in the tabulation.

Chart No. 4 provides a detailed analysis of special equipment and features which may increase rentals in an apartment hotel because they appeal directly to prospective tenants. Certain of these features require incorporation in the plan, and for this reason they should receive early consideration. Therefore, this tabulation has been divided, first into elements affecting the plan, then into factors of planning and equipment for living rooms, bedrooms, bathrooms and kitchenettes. Many of these factors are not only appreciated but required by apartment hotel tenants, as it is obvious that this method of living is luxurious to a degree only surpassed in finest private homes and large apartments. The tenant is ready to pay a high price for small space, provided that space constitutes an efficient and attractive home, easy and pleasant to live in, with a large proportion of the normal domestic problems solved through ingenuity of planning, equipment and service. The service features are also indicated in Chart No. 4, together with a number of miscellaneous suggestions. Naturally, these charts cannot be all-inclusive, but a serious effort has been made to include at least the more important features.

Chart No. 2 should be given primary consideration by the architect before the development of even the final sketch plans. In fact an analysis of the project based on Chart No. 2 will indicate primary elements of planning which fit almost any apartment hotel project and which will provide a basis for tentative as well as finished layouts. In Chart No. 2, will be found considerations for typical apartments; the possible requirements of food service, such as kitchen and restaurant space,

*Editor's Note.—This article is based on information obtained from experienced apartment hotel proprietors and real estate managers prominent in the New York operating field.

CHART 1. FACTORS INFLUENCING THE SELECTION OF A SITE FOR AN APARTMENT HOTEL

The following points should receive serious consideration in selecting the locality and site for a proposed apartment hotel project. Even after land is purchased, these considerations should influence decision to build.

Local Conditions

Established or coming social center.
Close to active life of city or frankly suburban.
Easy access to high class business districts.
Neighborhood definitely high class residential.
Quiet and privacy at night.
Garage facilities near by if possible.
High class shopping and marketing facilities near by.
Restricted against business encroachment.
Within accepted high rental districts.
Easy access to theaters and restaurants.
No smoke or fumes from nearby manufacturing.
Good buildings in neighborhood probable.

Physical Conditions

Lot size and shape for practical perimeter.
Subject to proper orientation.
Facing park or wide boulevard.
Adjoining church or permanent low buildings.
If not, buy adjoining lots to protect light and air.
Soundings if necessary to determine excavation conditions.

Appraisal Conditions

Well established and increasing land values.
Favored location for mortgage loans.
Logical location for type of building.
Land cost commensurate with rental market.

Rental Market

Is there a real demand for such occupancy?
Do local rentals justify this investment?
Can stores and shops be omitted?
Can restaurant be sub-let or open to public?
Can high class lunchroom operate profitably?
Is there a logical class of prospective tenants?

Miscellaneous

Experience of other buildings in similar locations.
Opinions of experienced realty managers.
Will landowner help in financing by subordinating part or all of land cost?
Will it be necessary to buy adjoining buildings to protect light and air?

CHART 2. ECONOMIC FACTORS WHICH INFLUENCE BASEMENT, GROUND AND TYPICAL FLOOR PLANS

The safest manner in which to approach the problem of planning an apartment hotel is to develop first a detailed written synopsis of aims and objectives to be attained in plan and equipment.

Typical Apartments

Determine logical range in number of rooms to each apartment.
Determine relative number of each size apartments.
*Establish standard sizes desirable for typical rooms.
From above data build up standard units from which logical shape of perimeter will develop.
Light and air important.

*See Chart 4.

Food Service

May require
*Kitchen space and storage.
*Restaurant and lunchroom with service.
Uncooked food dept.
*Service pantries.
Location of service elevator.
Kitchen or kitchenette space to be allowed in each apartment.
Location of shaft if incinerator is used .

*See article on page 265.

Other Services

Plan space for
General or private laundry rooms with dryers.
Trunk storage rooms.
Valet (in large building).
Maid service to apartments.
Servants' quarters for private domestic help.
Rooms and lockers for various employes.
Children's playroom.
Ballroom.
Garden courts.

Public Space

Main lobby.
Reception room for visitors.
Restaurant or tea room open to public.
Arcade, lounge or other special features.
Switchboard and house service desk.
Telephone booths.

Management

Executive offices.
Superintendent's quarters.
Maintenance department.

Sub-Rentals

May include
Restaurant.
Lunch or tea room.
Coffee and pastry shop.
Valet and barber.
Other concessions.
Retail stores and shops.
Physicians and dentists on ground floor.
Clubrooms.
Turkish baths.
Roof garden.
Furnished apartments.

Miscellaneous

Shape and size of lot.
Value of land.
Orientation, air and light.
Heights of adjoining buildings.
Character of adjoining occupancies.
Required rental per sq. ft.
Advisability of partial hotel plan and service.
Local building codes and laws.
Local insurance requirements.
Structural system adopted.

CHART 3. ELEMENTS OF INVESTMENT AND INCOME AFFECTING PLANS AND SPECIFICATIONS

Planning is the key to rental appeal and profits. Specifications cut maintenance and depreciation costs if good materials and equipment are used. Proper layouts and equipment will cut operating costs. This is the architect's responsibility—to design a *profitable* building!

Investment	Financing	Income	Operating Costs	Maintenance	Miscellaneous
Total investment. How much for land and excavation? How much for building? Allowance for furniture and decorations. Cost of restaurant and kitchen installation. Other special costs. Net building margin.	Are impressive sketch-plans required for: Mortgage applications. Mortgage bond issues. Coöperative selling. Leasing before construction. If coöperative— Apartment layouts to suit tenant-owner. If space is sublet— Layout to suit tenant.	*Primary sources* Apartment rentals. Furnished apartments. Restaurant-food service. Retail stores and shops. *Secondary sources* Concessions. Physicians' offices. Ballroom. Club quarters.	Heat and hot water. Refrigeration. Food service. Elevator service. Door and lobby service. Superintendent. Janitor service. Garbage disposal. Window cleaning. Maid service. Linens, laundry, etc. (if operated on hotel plan).	Plant upkeep and repair. Furnishing and upkeep of public space. Redecorating apartments. Repairs—plumbing and other installations. Exterior upkeep. Keep down expense by original use of good materials and equipment.	Is building for speculative or investment purpose? Exterior should be good but not lavish. Clever planning and modern equipment only can make the restaurant pay. Stores are not desirable. Public space should be cut to a minimum.

These charts present points for preliminary consideration before laying out floors and deciding general specifications for an apartment hotel project.

CHART 4. SPECIAL EQUIPMENT AND FEATURES WHICH MAY INCREASE RENTALS IN AN APARTMENT HOTEL

Following are suggestions covering points which appeal to the tenant of an apartment hotel and increase the rental income by justifying higher rents and decreasing vacancy charges and rental competition.

(See particularly articles on pages 227 and 253.)

In Plan	Living Rooms	Bedrooms	Kitchenettes	Service	Miscellaneous
Ample light and air. Attractive entrance. Good elevator location. Foyer in each apartment. Living room 300 sq. ft. or over. Bedroom 220 sq. ft. or over. Ample closet space and 35 sq. ft. minimum. Large bathroom. Large kitchenette. Separate service door. Dressing closets (where door beds are used).	Large, oblong, at least 300 sq. ft. Good floors. Fireplace and screen. Simple, attractive mantel. Good, restrained hardware. Simple side wall lighting. Avoid over-ornamentation. Electric outlets—3 or more. Wall space for large pieces of furniture. Concealed radiators. Ample windows. Good painted or papered walls not over-paneled.	Size and wall space for full furnishing. Large closets. Conservative decoration. Concealed radiators. Ample light. Cross ventilation. Overhead and side wall lighting. Electric outlets, 2 or more. **Bathrooms** Ample size, good fixtures. Electric outlets (2 or 3). Tiled floor and walls. Overhead and side light. Always provide shower.	Large enough to function as real kitchens. Full equipment built-in. Refrigeration. Garbage disposal. Service door. Dining alcove. Gas range. Kitchen cabinet. Built-in ironing board. Electric outlets, 3 or more. Floor, sanitary and cleanable. Walls, washable finish. Ventilation. Light, large overhead. Dishwashing machine.	Laundry, general or private rooms with dryers. Storage room in basement. Food service in restaurant. Food service to apartments. Uncooked food service. Package and mail deliveries. Maid and cook service. Cleaning apartments. Coal and wood for fireplaces. Window cleaning. Furnishing apartments. Ice water supply. Vacuum cleaning.	Convenient electric switches. Telephones in foyer and bedroom. Cabinet service doors. Supply cooking utensils. Generous closet space. Impressive exterior and entrance only good if inside is good. Efficient elevator service. Switchboard telephone service. Efficiency planning for double-utility space. Generous heat and hot water supply. Attractive restaurant. Efficient main kitchen.

service elevators, pantries in private kitchens; other forms of service for which space will be necessary; the possible requirements of public spaces and suggestions as to the types of occupancy which may be provided for sub-rental purposes. A number of miscellaneous considerations which directly affect planning will also be found in this tabulation.

Other elements, particularly those of investment and income which naturally affect the development of plans and specifications, will be found in Chart No. 3. Planning is unquestionably the key to rental appeal and profits. Specifications form the insurance policy against high maintenance and depreciation costs. Proper layouts and equipment will cut operating costs. Thus the various points indicated in Chart No. 3 should be analyzed from the viewpoint of making the project a profitable building, and a general budget can be developed which to a considerable degree will establish the amount of space and the amount of overhead cost which would be allowed under each division. Each apartment hotel project is a distinct problem. It is well known that no two are comparable, so the provision in these columns of actual income and expense figures on individual operations of this nature would be valueless and probably misleading. For that reason detailed suggestions are made in the various charts, and the sources of information are almost obvious. In fact it is quite probable that the architect can obtain much additional information from the owner, who has undoubtedly given serious consideration and comprehensive study to the problem, and from other sources of information.

In developing the plans and specifications for a complex and important type of building, such as an apartment hotel, there is a method which has recently come into vogue in several important architectural offices and can be highly recommended. This method involves the primary preparation of a comprehensive detailed report which fully describes the plan, construction and equipment of the building. The first step is to lay out a tabulation such as that accompanying this article, covering all the points which may occur to the architect or of which he may be told by the owner. These various subjects are correlated as in the charts presented here, and a full written description of the proposed building is prepared with suggestions as to how the various requirements should be made. To illustrate this preliminary report rough floor layouts are indicated, with perhaps a few thumb-nail sketches of important details. The next step is to go over this report carefully with the owner and with the manager, who should be selected during the early stages of the planning, so that the benefit of his advice may be gained. If no manager has been selected, a consulting expert should be called in,—an individual who has had practical experience in the apartment hotel field. As the various items are taken up point by point, the proposed solution of each problem is approved or amended, so that this final corrected report becomes an exact basis upon which to develop the first plans and the first draft of the specifications. In checking over the actual efficiency of this method, as opposed to the ordinary method of developing sketch plans and making tentative changes from time to time in a series of conferences, it has been found that the final approved plans and specifications can be arrived at in about one-half the time usually required and that, moreover, a more efficient building is usually developed. It is a strange fact that the average prospective owner of a building is not able to visualize the finished result from an examination of plans unless he thoroughly understands a written description. The type of report to which these paragraphs refer virtually makes possible visualizing the entire building through a descriptive exposition which begins with the proposed entrance and public spaces and covers the full layout, and at least the general equipment for all floors, typical apartments and surfaces, and other essential details.

In common with all types of investment buildings, the success of the apartment hotel project, measured from the architect's viewpoint, should be found primarily in profitable operation rather than in architectural beauty and structural success. The happy combination of these three elements is that for which the architect must strive. His fundamental responsibility is to create a building which contains in plan and specifications no obstacles to profit. In planning such buildings it must be remembered that among apartment hotel owners there is an established axiom to the effect that tenants rent from the "inside out," not from the "outside in." That is to say, that even though the exterior of the building may be impressive to the point of magnificence and the interior layout of apartments impractical and not of the required æsthetic and utility characteristics, apartments will be difficult to rent. On the other hand, a good, simple exterior with carefully planned and developed interiors and apartment layouts is almost certain to appeal to a dependable class of tenants. In fact, the architectural design of residential buildings, such as apartment hotels, often predicates the class of tenants.

In the article in this issue on the subject of "Efficiency Planning and Equipment" there will be found a description of a modern trend in planning apartment hotels which creates rentable spaces of a double-utility character, so that while maintaining a high rental income per square foot, the apartment hotel may offer to a tenant within a comparatively limited area all of the important features of living comfort which he may demand, but at an annual rental within the limits of his income. Buildings planned in this way offer not only high class living accommodations at a reasonable rental but they offer a solution of the problem of a tenant who wishes to live in the city during the winter months and in the country in the summer, because the overhead during the summer is not prohibitively high.

The Lake Shore Drive and The Belmont Hotels, Chicago

FUGARD & KNAPP, Architects; WARREN & WETMORE, Consulting Architects on The Belmont

IN the design of the new Lake Shore Drive Hotel, which we will consider first, the all-important factor of location was considered with great care, since the site the hotel occupies is of strategic importance. Furthermore, to develop this property to its highest and most efficient use, it was decided that for this particular location a building 19 stories high, adapted to high class apartment hotel purposes, would eventually prove to be the best investment, as its location was already surrounded by the most modern apartment buildings and hotels in Chicago.

With a passing word we may take for granted the importance of sound financing, correct location and good architecture; we may assume in this analysis that the type and general plans of this hotel will meet local requirements and establish a sound business prospectus. There is one test, however, which applies equally to the preliminary analysis of any hotel project, to the finished plans of the hotel, to the completed building and its administration,—it is the test of guest service. In any hotel the most important factor is rooms, and room service becomes of paramount interest in planning. Next in importance, and often of equal importance, is the restaurant service. The planning of the details of service rooms and restaurant forms the primary test factor in considering a hotel plan. Every hotel requires a different solution of these important service problems, depending upon location of site, dimensions of building lot and character of neighborhood. It was therefore decided in this case that the rooms should be laid out in four- and five-room suites, each having a large living room, small dining room and kitchenette, two or three bedrooms and a bathroom. These rooms are so arranged that they can be thrown together, enlarging or diminishing the size of a suite as occasion requires. It was desired that the layout of the public rooms should assume a domestic character, resembling in aspect the refined home of a gentleman, in order to attract the most desirable clientele.

The exterior design follows the style of the Georgian and Adam periods. The three lower stories are of Indiana limestone, conservatively enriched with small pilasters above the first floor. The shaft of the building is of a reddish face brick with light joints, while the upper portion is relieved with

The Main Entrance and Public Rooms Are in the One-Story Pavilion Extending Across the Entire Front of The Lake Shore Drive Hotel, Chicago

The Windows in the Dining Room of The Belmont Pierce the Deep Cove of the Ceiling, Forming Interesting Breaks

simple quoins and cornices of stone, and parapets which have balustrades and urns to create an interesting skyline. This treatment is carried around all the four sides, slightly simplified, because the building, owing to its unusual height, is conspicuous from all directions.

The walls of the entrance hall to this hotel are of a hone-finished San Saba marble, with small allegorical plaques to give points of interest. Bronze grilles and carved wood revolving doors of this entry afford an interesting contrast to the plain wall treatment. The main lobby possesses dignity in spite of the simplicity of its treatment. A delicately designed ceiling of patterned plaster, slightly arched, carried on a plaster cornice above fluted wood pilasters, forms the chief architectural feature of this lobby. The wall panels, slightly recessed, are in plaster. The entire room is in an ivory tone, painted and glazed. This treatment of the walls is in striking contrast to the rich red rug covering the marble floor. The furniture and ornaments, which are antiques, show to advantage against the plain wall treatment.

Marble steps at the west of the lobby lead into a spacious dining room decorated in the Adam style. Here simplicity is again the note through the sparing use of ornament and decoration. The tones of ivory and pearl gray, relieved by touches of gold

The Decorations of the Dining Room of The Lake Shore Drive Hotel Show a Restrained and Dignified Use of Motifs and Furniture in the Adam Style

and green, make up the color scheme. Plain walls relieved by delicate pilasters and wall torches of delicate design form a pleasing background for the costumes of the women guests, as well as for the attractive furniture, specially designed in the Adam style. At the east of the lobby the main lounge is entered by a short flight of marble steps. An atmosphere of rest and quiet was secured here by painting the ceiling to imitate antique walnut with polychrome decorations. The walls of this room are sand-finished plaster, perfectly plain except for recessed panels, and painted in an interesting shade of soft old gold. The floor is covered with a carpet of a deep plum color which tones well with the walls and ceiling. Under the ceiling light in the center a bright Venetian silk canopy, supported on wood masts, softens the light from overhead to a subdued and pleasing quality. The entire room is furnished in rare antique furniture, draperies and brocades. From this lounge opens a women's boudoir which is designed and decorated in Louis XVI fashion, appropriate to feminine occupancy.

On the 18th floor is located a cozy playroom overlooking an attractive roof garden. The walls of this playroom are covered with a reproduction of an old hand-painted French paper, which together with gaily painted wicker furniture makes this a charming and attractive place for recreation. The 420

Dining Room of The Belmont Shows an Effective Use of the Directoire Style in Decorations and Furniture

Coupled Columns and Pilasters in Pavanazzo Marble with Dull Gold Capitals Lend Dignity and Richness to the Lobby of The Belmont

rooms of this hotel are arranged in approximately 180 apartments, which may be increased or decreased in size according to the requirements of the tenants. Three to eight rooms form the suites in which tenants are allowed to prepare their meals themselves, or to have them served to them in their apartments by the management of the hotel.

The Belmont was planned as a residential hotel, so suites can be rented with or without kitchenettes, and owing to the flexibility of the plan even single rooms are procurable for transient rental during the summer months, when the renting of apartments is more difficult. The main lobby of the hotel is entered through a spacious arched vestibule, the groined ceiling of which is sumptuously decorated with sgraffito. The background of this sgraffito is a dull Della Robbia blue, roughly scratched, giving it life and vigor; with it the delicate ornamentation in stone colored coating contrasts strikingly. The lunettes below this vaulting are also treated in sgraffito with designs in fawn color showing large cartouches containing the hotel crest. In contrast to this rich decoration are the plain and severe stone walls below, and the delicately wrought bronze entrance doors.

Terra Cotta Details in the Adam Style Enrich the Upper Stories of The Belmont Hotel

The main lobby is an imposing room, 30 feet wide by 100 feet long, extending through to the west lobby; together they give a vista of 125 feet. This vista is closed by a beautiful fountain in the form of a niche, the background of which is covered with iridescent gold glass mosaic, softly illuminated, to throw a restful glow over the marble figure which forms the center of the fountain design. The lobby proper is reached from the vestibule by a short flight of marble steps flanked by imposing Ionic columns and balustrades of Pavanazzo marble. The walls of this entrance end are of San Saba marble surmounted by a delicately carved frieze of Greek figures in low relief. The upper walls of the main lobby are penetrated by mirrors in the form of windows having bronze railings, between Pavanazzo marble pilasters in the Ionic style. The ceiling is coffered with a center feature of delicately modeled plaques and medallions. On the north side of the lobby a short passage leads to a women's room in the Directoire style, having a flat and delicately ornamented ceiling of plaster.

The north lounge is a magnificent room, decorated in the rich and restful style evolved by Grinling Gibbon. The ceiling in this room is suggestive of an old English mansion. It is laid out in a geometrical pattern of English strapwork, painted in soft tones. To simulate the old ceilings it was found best to treat this ceiling with two coats of white shellac, rubbing and dusting it down with rotten stone to the desired antique effect. In this manner the thumb-finished background and ornament, together with the hand-finished moulds, give a soft and modulated color to the entire ceiling. The room, which is about 16 feet in height, is paneled in dark brown American walnut, effectively filled and waxed. In the center of this room the fireplace opening has been decorated with a marble moulding of Breche Violette, above which hangs an old English portrait.

The Belmont is equipped with a modern refrigerating plant which supplies all the hotel refrigerators, as well as the kitchen ice boxes, and ice water for the rooms. A special unit of this plant furnishes cooled air for the dining room and lounges. The kitchen is completely equipped with electric ovens and electric cooking devices of every sort, as well as with all modern kitchen machinery, dishwashers, silver polishers, cutting and mixing machines. It is unusually light and spacious, and has every known device and equipment to make it absolutely sanitary as well as convenient.

The heating system for the hotel comprises four tubular boilers with mechanical stokers, having a capacity in excess of 800 h. p. This system is complete in every respect, having also high pressure boilers providing steam for kitchens and laundries and for heating water and driving machines. Heating is on a vacuum system, permitting the regulation of the amount of heat in the radiators by the occupants of all rooms. The hotel has its own laundry, with complete equipment for caring for all hotel and private work. The Belmont contains 693 rooms, which may be divided into 250 apartments, ranging in size from three to seven rooms each, according to the varied demands of guests.

The Construction of Apartment Hotels

THE diversified problem presented by the actual construction of an apartment hotel building, or in fact of any large structure, is so extensive and has so many ramifications that it is impossible to present details in an article of this nature. It is the purpose, however, to make specific recommendations which may be of help to the architect as he faces this problem, and which may suggest some new and perhaps valuable ideas which can be easily made use of through consultation with engineers and building contractors.*

The first general decision to be made is in determining the type of construction which will be employed. There are two basic types used for this class of buildings. The first is steel skeleton construction with exterior curtain walls of brick paneled construction or of face brick and terra cotta tile. This type of construction is generally used, particularly if the building is more than six stories in height. The other type of construction which is employed occasionally is reinforced concrete, which is generally considered to be slightly less expensive than structural steel, depending on local conditions, and often requires more space than steel, and has not the same flexibility, thereby affecting the plan and the room layouts.

It is usually the case that the land on which an apartment hotel is located will bear a very high real estate valuation, and it is found desirable to provide as many square feet of rentable space as may be possible. Very often the increase of a room's dimension by 6 inches or by 1 foot makes a very definite difference in the rental value of an apartment, and for this reason it is advisable to seriously compare the two types in this connection. A determination of any dependable differentiation in cost between these two types of construction for an apartment hotel is extremely difficult and really reduces itself to taking bids on the individual building method. It is obvious, therefore, that as a decision in this matter must be made before plans are drawn, an inquiry into local conditions will provide the answer if from a structural viewpoint either reinforced concrete or steel construction will meet the requirements of the plan and comply with local building codes and laws. The speedy delivery of steel cannot always be secured, except through extra and prohibitive cost, and this condition alone may make it necessary that reinforced concrete construction be used. The location of the projected building often affects the type of construction, as in the case of a hotel located some distance from a shipping point, where the cost and difficulty of transporting the structural steel would involve too great an additional expense. It is therefore deemed wise to study the local availability of materials, and also the availability of the type of labor to be used.

At the present time in the larger eastern cities the high class apartment hotel of from 12 to 18 stories in Class A fireproof construction is costing from 72 to 84 cents a cubic foot. The smaller types of buildings, of what might be termed Class B fireproof construction, are costing from 45 to 66 cents a cubic foot, with a probable 5 per cent saving represented by the use of reinforced concrete if delivery and labor conditions are favorable. Another practical point for consideration in deciding on the type of construction is that of the speed with which the building can be erected and completed. Whenever possible, it is the desire of owners to have this type of building completed for the September renting season, since the class of tenants who lease in such buildings return to the city at that time. It is obvious that every month of delay in construction represents a considerable loss on the investment, and it may be found that local conditions are such that completion of one or the other type of construction can be guaranteed by contractors within a shorter period of time. If there is any question as to which type of construction should be employed, the safest procedure is to draw up sketch plans of the building and, before any working drawings, details and specifications are considered, obtain estimates from dependable sources as to the relative values of the types considered together with any other data available to assist in the final determination. It must be realized that consideration should be given to the sources from which mortgage money is to be obtained, because some mortgage bankers favor one or the other type of construction and will make appraisals accordingly.

All architects justly feel that the best is none too good when it comes to the question of construction, because the permanency of a building and the minimizing of maintenance and depreciation costs depend primarily on the quality of the materials and equipment selected and the quality of workmanship and construction methods employed. If the internal structure, that is, the floors, piers, beams and walls, are well built, the external details, such as partitions, finish and ornamentation, can be made simple or elaborate and changed if necessary. The structure of a building, even if it is carried out in a cheap and indifferent manner, can never be changed except by the most expensive kind of remodeling. The useful life of a building is primarily determined by its degree of structural excellence. In the past, cheap materials and equipment, particularly cheap mechanical equipment, piping systems, etc., have been employed in the effort to reduce first investment costs, and the result has been invariably that after a period of years the cost of maintenance and repairs

*Editor's Note — This article is based on information obtained from several well known construction engineers.

has mounted to almost prohibitive levels. A present-day comparison of old buildings in the hotel field is very interesting from the viewpoint of structural excellence. Certain old hotels which were originally well built are still functioning as highly paying investments. In these buildings external details have been changed, sometimes often, new types of decoration have been introduced; public spaces have been cut down and retail stores introduced through remodeling. Floors, walls and ceilings have been treated in various ways; new plumbing fixtures have been introduced, and a variety of changes made to keep the building modern, because of its original structural excellence. On the other hand, many buildings are to be found in which it is impractical to carry out modernizing alterations and external changes because the structural cores of the buildings are not good, and the investments are not justified. The useful life of a modern and well constructed apartment hotel can be safely established at from 33 to 40 years and depreciation figured on that basis, while if the construction is cheap and inefficient, the entire cost of the building should be written off in 20 years from a practical and economic viewpoint.

A careful analysis of construction methods and the advice of structural engineers and practical building contractors have double value, particularly if they be had during the early stages of planning. It is not possible to give many practical examples of the value of the construction experts' advice, but one detail may serve to illustrate this point. In some of the large apartment hotels recently built or under construction in New York and Philadelphia, the buildings are structural steel and fire-resistive throughout as required by local building codes and insurance regulations. It has been found, however, that by fireproofing steel beams with concrete these beams can be allowed to show in the finished rooms, being surfaced with the regular plaster finish employed. The heights from floor to ceiling as required by the building codes can in this manner be reduced several inches as opposed to the type of construction where floor beams are completely concealed. In a 15-story building this saving represents the height of practically one entire floor, which materially reduces the necessary investment without reducing the net rentable area. For buildings of this type, the steelwork is designed so that these beams will show in the apartments at regular intervals, and there seems to be no objection from the tenants' viewpoint, as in many instances the effect of the ceiling is good and is even emphasized.

The relative fire-resistiveness of the types of construction employed is highly important, not only to the degree enforced by local building conditions, but also from the viewpoint of safeguarding the investment, preventing a serious loss to the disruption of the hotel's business in case of fire and gaining a material reduction in insurance rates which often amounts to enough to justify the additional investment purely as a business proposition. The minimum of fireproofness in smaller cities and towns where building code requirements are not specific should be governed by the Board of Underwriters' rules.

The hazards of the building should be carefully analyzed, both the exterior and the interior. The principal fire hazards in an apartment hotel structure are exterior and vertical openings. If the building is constructed adjoining low or non-fireproofed buildings where there is a danger of conflagration hazard, steps should be taken to prevent the ingress of flames through windows and doors. Over dangerous exposures, wire glass windows should be used wherever possible, and window frames, sash, etc., should be of metal throughout. Vertical openings, such as elevator shafts, smoke towers, dumbwaiter shafts, pipe shafts, etc., should be constructed so that fire cannot spread through these passages. The construction will be of masonry materials, and all doors or openings into such shafts should be of metal and wire glass. The entrance doors to all apartments should be fire-resistive, and the trim of stairs and halls should be of metal or of fireproofed wood, which is much less satisfactory. In semi-fireproof buildings the floors should be divided into definite fire areas so that a continuous partition wall of masonry acts as a subdivision, and in case of fire it can be definitely confined to one section on the floor on which it originates. It does not seem necessary that trim and doors in the apartments should be of fireproof material, but it is good practice to surround occasional groups of apartment units with 8-inch brick walls and to have the walls of the public corridors of 6- or 8-inch fireproof material, such as terra cotta blocks, as in semi-fireproof buildings. This type of construction also insures stronger and more durable walls and partitions. Besides having the merit of a high degree of fire retardance, plaster on terra cotta, gypsum or plaster block is less liable to damage and less likely to develop cracks, thus providing a definite saving in maintenance and depreciation costs.

The importance of properly employed fire-resistive materials and fire protection equipment cannot be too greatly stressed, not only for apartment hotels but for all types of buildings. It is generally true that architects have never had sufficient information on this subject, and in many instances the insurance engineer will have a number of recommendations to make when plans and specifications have been completed without thorough consideration of this problem. It is a mistake to believe that the placing of an insurance policy is the beginning and the end of the problem of fire loss. While insurance may cover a fair proportion of the direct intrinsic loss, it does not pay for the interruption to income and other expenses which invariably are chargeable to a fire loss. The provision of proper protection against fire is termed "insurance engineering," and many large insurance companies, insurance agents, brokers and rating bureaus employ insurance engineers whose services are available for the

architect and owner. The rating bureaus, as organized by fire insurance companies, provide definite allowances for each standard item of fire protection incorporated in the building. These allowances are established in rating tables, and information is available to the architect through local underwriters and representatives of fire insurance companies.

Even at the sacrifice of some degree of costliness in interior decoration, the structural integrity of a building should be maintained under rigid specifications. There are certain points where high maintenance costs will be sure to develop if the original installation and workmanship are not of the best. One very important factor is the roofing of the building. Architects are familiar with the built-up roofings for large flat areas and other types of roof construction, but many instances have been known in which weak spots were left by the use of improper flashing materials and other exterior metalwork which because of local hazard conditions in the air,—local dampness and salt air,—or because of the nature of the metal employed, deteriorated rapidly and demanded constant maintenance and frequent replacement. Careful study should be given to this question, and local conditions should be analyzed. There are available several types of good exterior metal materials, each well fitted to meet given conditions provided the selection is made after an analysis of the situation. Similarly in the provision of pipe and plumbing fixtures. A chemical analysis of the local water should be obtained with definite information as to the type of metal which can logically be employed in that section. To the deterioration of piping, particularly in older buildings, where the plumbing lines were concealed, may be charged a tremendous annual loss in the building field. Similarly, with elevator equipment and other forms of mechanical equipment required in buildings of this type, there are today a number of apartment hotels where constant trouble and annoyance are the result of using poor installations, and in one instance at least which has come to the writer's attention, the cost of repairs and replacements has in the first two years exceeded the additional cost of put-

A Study of Typical Apartment Plans for an Apartment Hotel. These Are Plans of the New Windermere East (Chicago). Note Combination of Regular and "Efficiency" Planning.
C. W. and Geo. Rapp, Architects.

ting in a first class elevator installation when the structure was built. Attention may also be directed to the proper finishing of public spaces in the building. Floorings should be selected with an eye to long wear, minimum discoloration and ease of cleaning. Similarly, coves, bases and wainscoting should be of materials which meet these requirements. The necessity for repainting, replacement or use of abrasive cleaning should be avoided entirely, not only because of expense but because of the interruption and annoyance occasioned tenants.

This article would perhaps not be complete without a brief reference to the architect's relations with the general contractor and subcontractors who may undertake the building of an apartment hotel. Certain specific requirements enter definitely into the construction of a building of this type. In the first place, there is invariably a demand for speed. Building progress is scheduled to meet rental demand. In a situation of this kind it is the owner's duty to allow the architect definite leeway in the selection of contractors and to refrain from insisting on the acceptance of lowest bids. The reputation of the contractor's organization has intrinsic value, if it is good. Where loose specifications are provided and cheap bids are accepted, there arise almost from the beginning constant bickering and time-consuming disputes or arbitrations. All apartment hotels are, or should be, well constructed. The use of good materials demands the workmanship and efforts of skilled contracting organizations. Good mechanics and craftsmen are absolutely essential, and in most instances, particularly in the larger cities, this type of mechanic is available primarily to the well established contracting organization which pays well and thoroughly understands the handling of the trades. In placing the contracts, therefore, not only price but the element of time and excellence of performance should be definitely included and evaluated, so that the owner may clearly choose between satisfactory progress and performance or the dangerous results of delay and inefficiency.

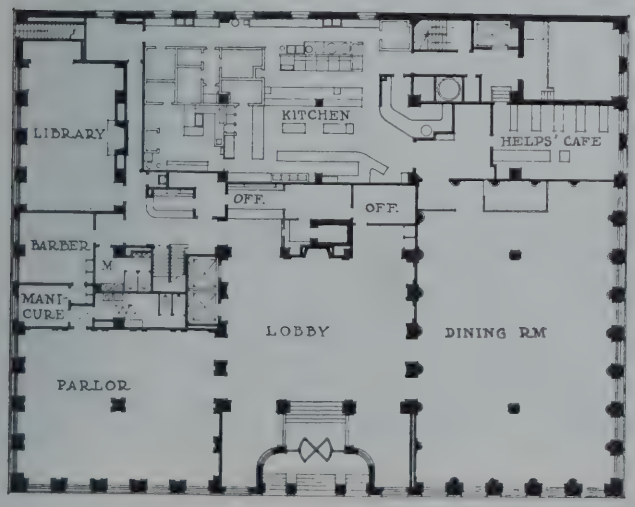
In letting contracts for construction work careful consideration should be given to the possibility of including proper arbitration clauses so that disputes which might arise will not involve serious delay in the progress of the work. Financing arrangements should also be of a definite character with a clear understanding as to when payments are to be made and the method of making payments. The owner should know exactly what will be expected of him in this respect and should realize that as he expects service from the architect and contractor, so he must discharge his duties to them justly and without delay.

The Jacobean Library in The Pearson Hotel, Chicago
Robert S. De Golyer & Company, Architects

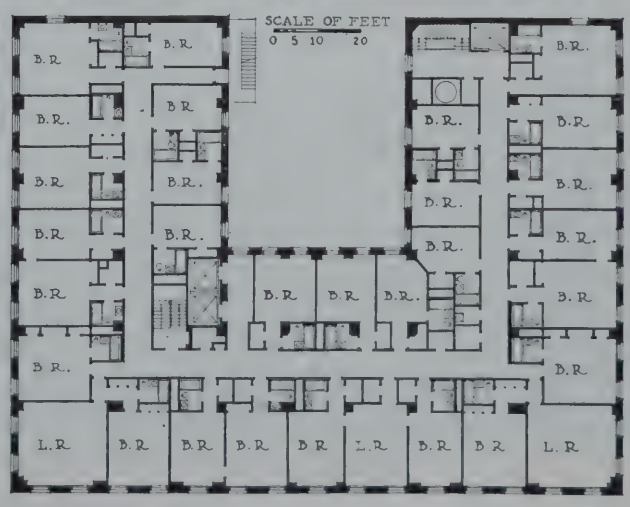
The Pearson Hotel, Chicago

ROBERT S. DE GOLYER & COMPANY, Architects

A COMPACT, balanced and well studied plan. Exterior walls are of brick and Indiana limestone. Construction is the skeleton type of reinforced concrete. Heating is by vacuum steam, no automatic temperature control. Electricity provided by public service company. Elevators are car switch control, 500 feet per minute. Cars finished in American walnut. Windows are of wood frame and sash, double-hung. Entrance lobby is finished in American walnut. Dining room is a combination of plaster and birch trim and columns painted. Floors: marble in lobby, terrazzo in the dining and living rooms. Cement, carpeted, in all the tenants' rooms. All walls on typical floors are canvased and paneled with wood mouldings. Cost per cubic foot, approximately 65 cents. Work begun October, 1922. Number of rooms, 325, arranged for combination in apartments of varying sizes.



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN

THE DINING ROOM SHOWS CEILING AND WALL TREATMENT IN THE ADAM STYLE

THE LOBBY IS A FINE EXAMPLE OF THE ADAPTATION OF THE WORK OF GRINLING GIBBON

THE PEARSON HOTEL, CHICAGO

ROBERT S. DE GOLYER & COMPANY, ARCHITECTS

Special Equipment for Apartment Hotels

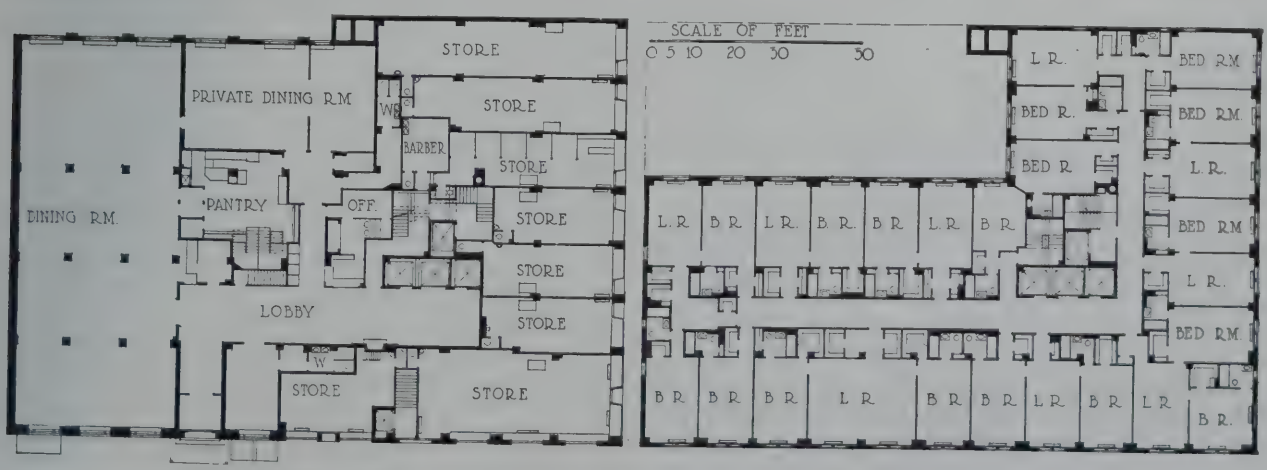
By WILLIAM L. ROUSE

Of Rouse & Goldstone, Architects, New York

THE importance of the apartment hotel as a factor in the housing situation is due to changing economic and social conditions which have been intensified by high rentals and the difficulty of obtaining efficient domestic service. An analysis of the types of tenants who lease space in apartment hotels indicates that approximately 20 per cent are those who have given up city homes because of the high cost and inconvenience of maintaining large establishments; about 40 per cent consist of tenants who use apartments in the fall and winter months and live in country homes or hotels in the summer, while the remaining 40 per cent are retired business men and women or families having good incomes, but not desirous of carrying the burden of regular housekeeping establishments. The entire tenantry in the apartment hotel classification may be characterized as a group accustomed to good living conditions and able and willing to pay for the modern conveniences and comforts of living.

It is evident that as the primary purpose of the apartment hotel is to cater to this special class of residents, the problem of convenient and even luxurious equipment must be studied carefully and an effort be made to meet every possible demand which might arise under these conditions of living. With the definite limitations of space established in planning in apartment hotels, one of the first considerations is to provide unusually ample closet and storage space. A relative quantity of closet space should not be that of the average apartment, for it should be remembered that tenants of the type who will lease space in the apartment hotel usually possess more than the average quantity of clothing, luggage, sport gear and other equipment which requires space for active storage. There should be one closet opening directly from each bedroom and containing at least 35 square feet which will provide ample room for hanging a large number of dresses, coats and suits. The upper part of this closet should have deep shelving which will accommodate bags, bedding, hat boxes and similar equipment used only occasionally. There should also be shelving for shoes, and the tenant will usually find space in this closet for storing a sewing machine if desired. A linen closet is an important adjunct in such an apartment and will be used not only for the storage of table linens but for towels and sheets. It should be located close to the bathroom. There should be at least two additional closets, of not less than 15 square feet, equipped with upper shelving, hanging poles and hooks. Many tenants in apartment hotels employ domestic day service, and a small closet should be provided for a maid's uniform and clothing. No consideration need be given to trunk storage space, since this is provided in the basement where a general checkroom is usually sufficient.

It is, of course, a valuable addition to the plan if a closet can be provided opening directly off the bathroom. This closet would be used for the storage of linens and towels, and it should also have small shelving for bottles and other paraphernalia for which there is no room in the average medicine cabinet. Wherever possible two medicine closets should be built into the walls of the bathroom, affording an appreciated extra convenience. The plan and equipment of the bathroom should receive particularly careful study, and any extra provisions in this room add greatly to the rental value of the apartment. It is a mistake to cramp the size of the bathroom or to crowd the fixtures together. When possible, there should be sufficient wall space to allow the introduction of a small dressing table and a hamper for soiled clothes. The fixtures should be selected with care, not only to keep down depreciation and maintenance cost but to provide an impression of luxury, comfort and highly sanitary conditions. The bathtub should be of the built-in



Ground Floor Plan

Typical Floor Plan

The Madison, New York

Rouse & Goldstone, Architects

Rich Toned Rugs, Old English Furniture, Lamps and Ornaments, Have Produced an Atmosphere of Refinement in the Lobby of The Madison

type with no space underneath, and coved where connected with floor and walls so that it can be easily cleaned. A shower bath should always be installed with proper mixing valves, and in the more expensive apartments a separate enclosed shower bath is greatly appreciated. Provision should be made for ice water supply in the bathroom, and there should be both overhead lights and side lights for mirrors.

This room should have at least one and preferably two electric outlets. Floors and walls should be surfaced with tile, and it is interesting to note the recent trend away from the use of white tile. For flooring many architects are introducing gray, black and other neutral colors which offer a pleasing effect, the colors being introduced into the walls also, and the tile manufacturers are encouraging this trend by providing unusually attractive colors and finishes. The use of color in the bathroom seems to have a distinct appeal to the feminine members of the household and gets away from the monotonous white which has become a national habit, based perhaps on its sanitary appeal and possibly on the fact that in years past it was not easy to get good tile in colored glazes for this purpose.

The market offers a wide and interesting variety of built-in fixtures and bathroom conveniences. Soap dishes, towel bars, toothbrush holders and other conveniences are to be had in the form of specially designed enameled or the more desirable porcelain fixtures ready to be built into the tilework. These are sanitary and practical and should be included in planning when specifying for the bathrooms. Where space allows, an extra lavatory affords a definite convenience. The bathroom should be comfortably heated, and small wall radiators are found to save floor space. Heating the bathroom by means of a riser only is not satisfactory.

In the kitchen it is well to include a built-in ironing and sleeve board which folds into a small closet when not in use. This closet will also serve for brooms and mops and should have a small, low shelf where the electric iron can be kept. An electrical outlet located in this closet is a great convenience. Special kitchen equipment of utility and space-saving nature is discussed in other articles in this number of THE FORUM, but a few notes will not be amiss here. The average apartment in this type of building has what is termed a "serving pantry" or a "butler's pantry," but which often achieves the full service capacity of a regular kitchen. In many apartments it is a room of from 65 to 80 square feet, having full equipment of gas range, ice box, kitchen cabinet, cupboards and sink. Again, it may be reduced to the kitchenette type of long, narrow closet containing sink and ice box, with storage cupboards and in most cases at least a small electrical range so that food warming and even light cooking can be done. This feature is thoroughly appreciated, even by families taking most meals in the restaurant, and in many apartment hotels uncooked food service has been established as a convenience for tenants.

In view of the fact that this phase of housekeeping will exist to a greater or lesser extent also, provision should be made for garbage disposal and the delivery of ice, groceries and other kitchen supplies. Electrical outlets should be provided, at least two or preferably three in number, as the conveniences for electrical cooking have been developed to such a high degree that two or three utensils may be in use at one time. Many apartment hotels include small electrical dishwashing machines with the larger apartments, and these are found to appeal to tenants. Another useful piece of equipment, where there is space for it, is a small clothes dryer hung at the ceiling, since it is usually found desirable to launder silk and other delicate pieces in the apartments, and a small amount of drying space is needed. In kitchens and kitchenettes floors should be attractive and sanitary, and the materials suggested include tile, linoleum, or rubber. Walls will be preferably tile up to a height of 6 feet or else finished in some washable surfacing. Definite provision should be made for forced ventilation unless there is ample window space, in which case hoods and flues should be provided to draw off heat and cooking odors. Kitchen cupboards and pantry equipment are now manufactured in steel as well as in wood and in a great variety of convenient stock sizes and shapes, so that the architect has merely to choose from the viewpoint of capacity, cleanliness and appearance. Sinks should be of porcelain with hot and cold water supply and large drain boards. Ice boxes are preferably of the electrical type or kept chilled from a central refrigerator system. The necessity of delivering ice should be eliminated wherever possible, as it creates awkward complications in households such as these. Gas and electrical stoves have been developed within the past few years to a point where further ingenuity seems impossible. They may be had in all sizes and capacities, from two to six burners, with or without ovens and broilers, with smooth cooking tops or in combination of gas and electricity, and all designed so that they occupy very little space. They are the last word in convenience.

Entrance Hall of The Madison Shows Paneling, Carved Door Entablature and Cornice in the English Renaissance Style

For the living room there are many refinements which justify high rentals and provide conveniences to which tenants have been accustomed when occupying large apartments or dwellings. The introduction of a fireplace is invariably appealing, and it often justifies increased rental of $300 or $400 a year, which is a good return on the additional investment necessary. The fireplace and mantel should, of course, be in correct scale according to the size of the room, and the hearth and facing should be in warm masonry colors, using tile, face brick, or marble. The depth of the fireplace should be sufficient to insure a good draft and complete avoidance of the smoke nuisance. A throat damper should be placed in the flue with a movable deflector plate, so that the heat can be controlled. The mantel chosen should be simple, not ornate, as the decorative

The Madison, New York, Is a Typical High Class Apartment Hotel in Which Shops Have Been Introduced on the Street Front

feature can better be left to the tenant's taste in furnishing his own bric-a-brac. The lighting for this room will be preferably of the side wall type, and electrical outlets should be so placed that any part of the room can be lighted with a floor lamp. There should also be outlets for table lamps, and the recommended minimum number of outlets for a living room is three or preferably four. Attention is directed to the newer types of multiplying outlets which are small fixtures available for transforming one outlet into two or three at the tenant's convenience. The side wall lighting should be controlled by a conveniently located switch close to the entrance door, and each light should have the usual independent cut-off.

The living room floor is preferably of hardwood and provided with waxed finish. Walls will be treated in accordance with the architectural motif of the room. Painted, stippled finishes and wall paper both have their advocates. Care should be taken not to cut up the wall surfaces with too much decorative paneling. The placing of doors and windows must take into consideration the fact that the average tenant will have at least three large pieces of furniture—a grand piano, a refectory table, and a divan. It has been found a paying investment also to provide a fire screen in each apartment instead of leaving installing this precautionary device to the tenant. Where there is a fireplace there should also be provided in the kitchen or kitchenette a special box for storing a small amount of wood or cannel coal. To prevent wall damage in the hanging of draperies, the management should be ready to provide and install the necessary boards above windows. The heating of the living room should be from concealed radiators, usually placed under the windows, and of a type low and as unobtrusive as possible. Windows should be located from the viewpoint of interior decoration so that their treatment may be correctly handled. In some apartment hotels windows will be unusually large because the living room is designed as a studio In general, however, the use of average size windows in groups of three or four is recommended.

In the bedroom the spacing of wall surfaces must be carefully considered, so that the average bedroom suite, consisting of twin beds, chiffonier, dresser, "vanity table," night table and chair, can be accommodated without overcrowding. The principal bedroom should not be less than 12 by 18 feet, and perhaps nothing is more greatly appreciated by tenants than ample size in such a room. Here again the location and size of windows should be considered from the decorative viewpoint, and radiators should be made as unobtrusive as possible. The lighting in this room can be of an overhead type, but at least two side wall lights should be provided, and three electric outlets to care for reading lights on beds, table lamp, and one floor lamp. Provision should be made for a telephone in the bedroom and in the foyer. The hardware and lighting fixtures for bedrooms and living rooms should be selected with great care and should be of simple, good lines and finish. These fixtures are preferably not of too definite a period nature, but should be chosen in form and coloring to blend with any type of furniture and decoration which the tenant may choose, unless the apartments are let furnished.

In approaching this problem of equipment, the primary objective should be to anticipate the tenant's mode of daily life and domestic activity and to provide all possible modern facilities for comfort, time saving and efficiency to make the house attractive.

Fenway Hall, Cleveland

GEORGE B. POST & SONS, Architects

NUMBER of apartments 189, accommodating approximately 400 guests; one, two or three rooms and bath to each apartment. Tenants permitted to prepare meals. Complete kitchenette equipment, including iceless refrigeration, is provided. Management will serve meals in either main dining room or apartments. A successful feature of this hotel is the coffee shop. Kitchenettes are equipped with gas ranges, sinks, iceless refrigerators, small cupboards, tables, ironing boards and cupboards, storage and kitchen utensils. No servants sleep in the house. About 37 per cent of the tenants, or 150, can be seated in main dining room, and about 30 per cent in coffee shop, 87 at separate tables and 33 at counters. Construction: steel, metal joists. Interior partitions: terra cotta tile. Heating: steam furnished from outside company. Vacuum cleaner provided. Begun July, 1922.

FIRST FLOOR PLAN

TYPICAL FLOOR PLAN

Photos. Tebbs & Knell, Inc.

VIEW IN LOBBY TOWARD DOORWAY TO ENTRANCE FOYER

ENTRANCE TO COFFEE SHOP, SHOWING WALL DECORATION

FENWAY HALL, CLEVELAND

GEO. B. POST & SONS, ARCHITECTS

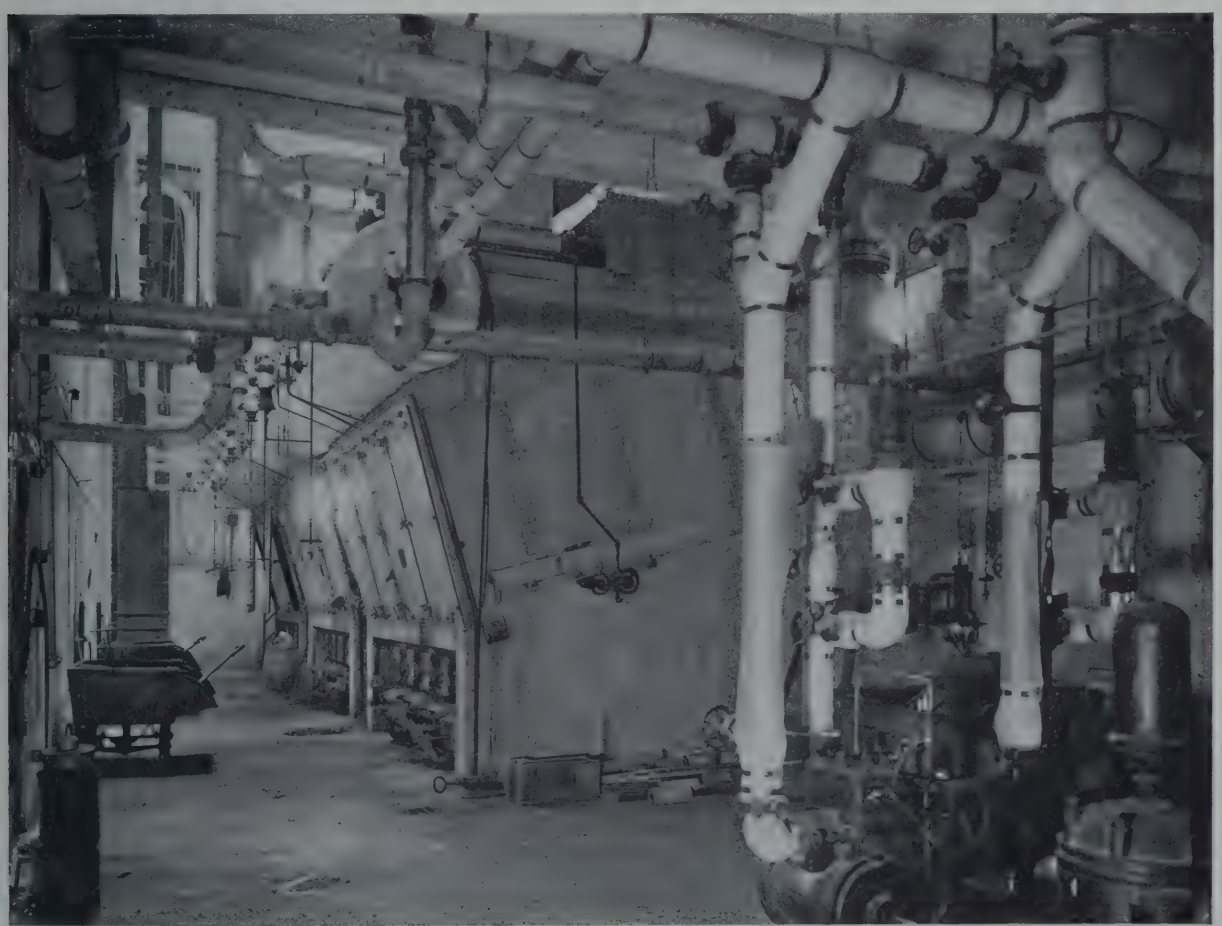
Mechanical Equipment of Apartment Hotels

By J. F. MUSSELMAN, M.E.
Consulting Engineer, New York

AT the outset it is necessary to start with a definition, for there is likely to be a difference of opinion as to what constitutes an apartment hotel. For the purposes of this article, we shall maintain, with disregard of anything the dictionaries may say to the contrary, that an apartment hotel is one equipped not only with a restaurant designed to accommodate the tenants of the building, but also equipped in such a way that meals can be prepared in each individual suite or served to the suite from the restaurant kitchen. This double-barreled culinary arrangement is popular and is becoming more so. It fits ideally the family with a variable appetite and no servant. Even the lack of this latter luxury is not serious in a building of the kind described, for the management usually provides at a small additional charge servants fitted for any emergency or for regular requirements.

As compared with a regulation apartment house, the individual kitchens of an apartment hotel have shrunk, or have been compressed, and the name has been changed to "kitchenette." They have been made parts of the living rooms or ends next to windows have been partitioned off with cabinets and called "dining alcoves." The baths, too, have been moved away from the windows, to meet the demands of modesty, perhaps, and now occupy places on small vent flues and have only artificial light. All of these changes and rearrangements have necessitated corresponding changes in the building arrangement, until the equipment of an apartment hotel is distinctly different from that of an apartment house or that of a hotel.

As regards the heating apparatus, no very radical change in type has come about, the heating equipment of a modern apartment hotel being not unlike that of the modern hotel or apartment house. One question that does arise, however, is whether these inside baths should be heated, and if so how. They have no exposures, and at first thought it seems as if they should keep warm without any special provisions, but the facts that a bath, to be comfortable, must be warmer than a sleeping room and that a bath should be kept warm at night when the sleeping room is cooled down, have to be taken into account. For these reasons it is necessary that all baths,



The Boiler Room of the Hotel Pennsylvania, Philadelphia, Shows Some of the Mechanical Equipment Needed in a Large Apartment Hotel

whether they be inside or exposed, be provided with radiators if they are to be comfortably heated.

The system of heating usually selected for tall apartment hotels that is called, through courtesy, a modulating steam system. The fact that with such a system the temperature cannot be modulated does not seem to have detracted from the popularity of the name. At any rate it is the best we know for such a building, and has marked advantages over the one-pipe steam system that was once in general use. For the low and long drawn out building, no other system of heating has as many advantages as forced circulation hot water. It is economical in operation, not excessive in first cost, and is readily adjusted to the idiosyncrasies of the weather.

Whatever the system of heating may be, the requirements in the way of boiler plant are about the same. On account of the requirements of a steam kitchen for the restaurant and probably a steam laundry, it is necessary that at least part of the boiler plant be operated at medium pressure, that is, from 60 to 100 pounds. On this account it is generally desirable to operate all boilers of the plant at medium pressure, which can be done with the same efficiency and considerably simpler piping arrangement.

Too often in buildings of this kind the boilers are crowded into whatever space happens to be left after other requirements have been met. It isn't the question of ease of repairs only, but the ever-present operating costs that make a properly located and adequate boiler room imperative. It should be correctly located, relative to the fuel and other parts of the mechanical plant as well as to the load, and should have sufficient height and area to make crowding unnecessary.

The kind of fuel to be provided for is that which will secure the minimum total cost of generating steam at the time the building is constructed. But this is likely to change with the changing prices of fuel, so as a safety precaution it is well to so arrange the equipment that coal can be substituted if oil is used, or the reverse. As a rule no extension system of automatic temperature control can be afforded in a building of this type, on account of the fact that the first cost of the building is given more serious consideration than the cost of operation. There is little doubt but that a simple, reliable, inexpensive system of temperature control on every radiator would be a good investment for any such building.

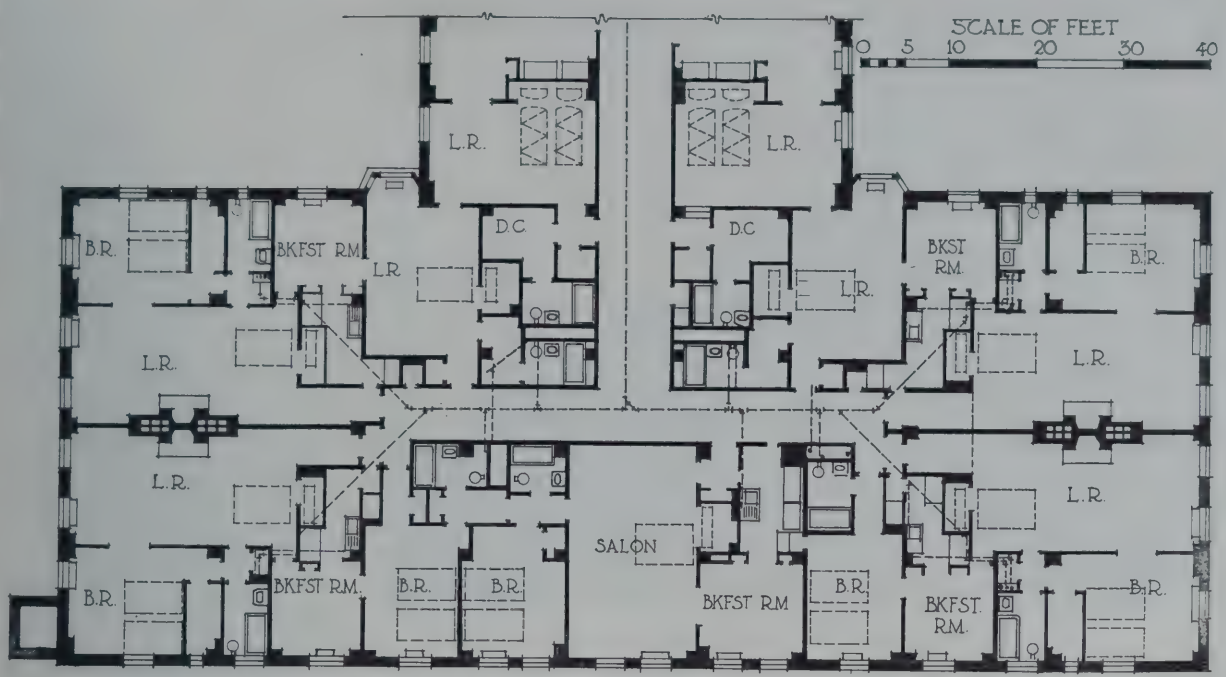
More ventilation is required in an apartment hotel than in an apartment house—which as a rule has almost none at all. The restaurant and its kitchen must be ventilated in the same way as those of a hotel, for if this is not done, the odors of food will find their way immediately to the tenants' suites. Other public portions of such buildings are generally provided with no ventilation. The baths, if they have no windows, must have an exhaust system with either high velocity in the flues and a fan on the roof or with larger flues and a gravity ventilator. The fan, if used, depends for its usefulness on the inclination of the operating engineer to keep it running, while with the gravity ventilator one assumes that the wind will always blow; neither premise is altogether sound. The individual kitchenettes of such a building, opening, as they usually do, directly into the living rooms, imperatively require positive and ample exhaust ventilation in order to control the cooking odors. This can be best effected by connecting each range hood vent to a general vent flue, in which positive air velocity is always maintained. With wall beds or door beds that fold up in closets or unexposed dressing rooms, it is undoubtedly advisable to exhaust some air in such a way as to cause a circulation around the beds.

The ice problem of the apartment hotel is annoying, and it presents service difficulties that are hard to overcome and expensive to eliminate. The better class apartment hotels are coming once more to the use of mechanical refrigeration for kitchenette refrigerators. This can be done by either the unit type of machine in each box or by a central system with brine circulation through coils in the boxes. This latter system may seem primitive and out of date, but its first cost is only about half as great as that of a unit system, and it has the advantage of being noiseless and comparatively free from danger from shutdowns for repairs.

From the standpoint of plumbing work, there is little difference between an apartment hotel and any other kind of a hotel. The amount of water consumed per capita is about the same, and the storage and heater capacity requirements can be estimated from the same tables as are used in hotel work. As in hotel work, or in fact in any work where hot water is corrosive and the temperature carried is high, it is necessary to make provisions for protecting the pipes of the hot water system, either by removing the corrosive elements from the water when it is heated, or by the use of materials in the piping that are not easily susceptible to corrosion. The character of the water used in the building is the principal factor in this matter of corrosion. The chemistry of the local water supply should be determined, and piping material chosen accordingly.

Where the water available for the plumbing system is hard, it is sometimes advisable to use a water-softening plant, especially if a central laundry is included in the building. As a rule this is not considered necessary for water used by the tenants. Conveniences that are coming into general use in apartment hotels are electric dishwashers in combination with the kitchen sinks. These are comparatively simple devices, and in doing an unpleasant task with efficiency they meet with high favor among the tenants.

Tenants in modern apartment hotels demand vacuum cleaning equipment, and it is customary now to see that the tenant's every wish is gratified. The vacuum cleaning provision may be nothing more



Typical Apartments in The Hotel Walker, Washington

Typical Apartments in The Hudson View Apartments, New York

The Hudson View Apartments, New York, Have Fire Escapes Set into Wall Recesses Which Help to Conceal Them

than electric base plugs, distributed in such a way that portable machines can be used, but it cannot be denied that portable machines are less efficient in their cleaning than a central system and are generally objectionably noisy. They also suffer by comparison from the fact that after the sweeping is done, the machine still has to be cleaned and the dust disposed of. If a central vacuum cleaning plant can be afforded, it is not logical to be too economical in the number of outlets, and it is certainly more convenient, from the tenant's point of view, to attach the hose to an outlet in his own suite than to connect with an outlet in the public hall and allow the hose to string past the doors of other tenants.

The garbage or rubbish of an apartment hotel is of a different character from that of an apartment house or that of a hotel. This arises from the fact that it is of two different origins. The portion which includes that from the restaurant and public parts of the building can be handled in the same way as that of a hotel, and involves no unusual problem, but the garbage from the tenants' kitchens, which are provided with no dumbwaiters and often inadequately provided for in service elevators, is a nuisance unless some incinerator provision is made. The obvious method of disposing of this tenant garbage and rubbish is to provide in each apartment a flue with an incinerator at its base, into which it can be thrown as it accumulates. Wrongly located, flues and incinerators have a disagreeable habit of getting in the way where there are large public spaces in the lower stories. If there is a roof garden, such incinerators should be made to discharge into a special chimney built for the purpose. On the whole, they are more popular than an individual incinerator in each kitchenette, for these occupy valuable space and are not always free from odors.

The elevator equipment is probably the first thing that a prospective tenant sees when he enters the house, and for this reason the building is apt to be judged as good or bad by its elevators. If these are unusually slow, badly arranged or fitted with cars that are gaudy and cheap, an impression is made that can never be lived down. The usual speed for fireproof city houses is 350 feet per minute, but this is excessive for six-story structures, and for such buildings a speed of more than 250 feet is unwarranted. The type of elevator control is undergoing a radical change just now — a change that eliminates the elevator boy. The automatic push-button control, whereby each man is his own elevator boy, is coming into general use. Such elevators are reliable, safe, and, from the owner's standpoint, remove one of the largest items of operating costs. It might be well to add a word of warning against placing elevator machines overhead in a building of this kind. The noise of overhead machines is a nuisance difficult to overcome.

In this electrical age of ours, there is continually less opportunity of doing anything original or unusual in the way of electric installation than in any other kind of equipment. For this reason the designing of the electric installation, from the standpoint of the engineer, is drudgery of the most uninteresting kind. It consists, for the most part, in locating outlets of unnecessarily large capacity in the most obvious places possible, and then persuading the owner that he can afford still more plugs.

Appliance outlets for electric irons, toasters, hot plates and percolators are insisted on by modern tenants, and whether they are used or not, they have to be provided. Such outlets, when they are in use, consume current at such a rate as to necessitate substantial additions to the feeders on their account. The use of electric ranges in the individual kitchens is a genuine convenience. At first thought this seems an extravagant luxury, but the periods of use of such ranges are so short that where electricity can be had at a cost of three cents per kilowatt hour there is very little complaint of excessive cost to the tenant.

The location of tenants' electric meters requires some little study, since these locations must be approved by the company serving the building, and they are surely most unsightly if they are placed on the walls of one of the principal rooms. As with all other kinds of equipment, it is, of course, necessary to conform to the requirements of the underwriters and the local codes of building and wiring.

The Interior Architecture of Apartment Hotels

By W. SYDNEY WAGNER

Of the Firm of George B. Post & Sons, Architects, New York

IT may have been the grandiose and pompous effect so frequently aimed at in the interior architecture of hotels a generation ago that led an English visitor to observe that Americans, since their homes are generally of only moderate size and seldom if ever splendid, are obliged to express their fondness for magnificence upon a vast scale, to indulge their liking for the halls of baronial England or eighteenth century France, in their hotels! It could scarcely be maintained that this tendency has as yet been wholly overcome,—perhaps it was too deeply rooted,—but considerable familiarity with modern hotels of every kind proves that at least it has been curbed, and that several hotels recently built are exerting the influence which follows the setting of a good example.

Nothing so immediately establishes the character of any hotel, and perhaps particularly an apartment hotel intended for occupancy for at least a considerable period, as the impression of its interior architecture which the visitor receives as he enters. This character is determined largely by the location of the house, the type of its clientele, and also to a considerable extent (though perhaps less than is sometimes supposed) upon the amount of money which may be spent. Different rooms of an hotel demand different types of architectural treatment; an entrance hall or lobby, open as it is to the public, may well express hospitality of a somewhat dignified order; a ballroom or banquet room, upon the other hand, by reason of its very functions should be made to suggest gaiety and lightness; a dining room or restaurant should emphasize the idea of comfort and hospitality of an intimate kind, while in the family rooms of an apartment hotel there lie so many opportunities for expressing domesticity and intimate comfort that one marvels at the chilly, austere and at times even forbidding atmosphere of family rooms even in some of the best apartment hotels. The character which is so desired by the owners of the hotel and valued by the guest is not altogether a matter of furnishing,—not even entirely a matter of decoration,—but it depends in the final analysis upon what the architect has provided as a background or basis for decorations and furnishings.

An apartment hotel, being less of an hotel than a home, may well express domestic comfort of a high order. Intended to a considerable extent for winter occupancy, it should make use of architectural types which are rich even though simple. Almost any style of interior architecture which would be appropriate in a fine private home would

Solarium on Roof of The Sagamore Hotel, Rochester, Decorated and Furnished in Chinese Chippendale Style
John Archibald Armstrong, Architect

Jacobean Ceiling Combined with English Renaissance Paneling; The Belmont Hotel, Chicago

be suitable, though care should be taken to select a type of which the guest or tenant will not quickly tire. Scarcely anything could be better suited to such use than the English styles, Jacobean, Stuart or Georgian, abounding as they do with opportunities for securing effects which may be intimate, domestic and richly simple, or else by a somewhat different treatment be made slightly formal and even ceremonious. These styles have stood the test of time and have been found adaptable and satisfactory. American architects are beginning to realize the opportunities which the Jacobean and Stuart styles present for use in living rooms, libraries, dining rooms and restaurants. Their paneling may be developed in woods far less costly than oak and yet be given much the same finish; the plaster or "parged" ceilings in relief may be flat or coved and as elaborate or as simple as desired, and the provision of such a setting should stimulate decorator or furnisher to carry out the English effect, which may be done at no great cost. Much may be made of the early American type, an outgrowth of the English styles, and this type, which is particularly appropriate for family rooms, may be economically worked out besides affording an opportunity for successful decoration and furnishing. Much can be done when architect and decorator are persuaded to work in harmony. In this way unity is secured.

The entrance hall or lobby of an apartment hotel

Architectural Treatment of Main Lounge in The Belmont Hotel, Chicago, Gives Distinctive Elegance to This Room

may well differ in certain important respects from that of an hotel intended for transient patronage. In an hotel of the usual type the thing chiefly desired is probably to get the guest registered and into his room, and with this in view the office and elevators are placed in positions of prominence. In a house of the apartment hotel type, on the other hand, office and elevators, while they must be readily seen and be easily accessible, need not be made quite so prominent. Opening from this lobby, lounge or hall, placed near the entrance, there may be a small reception room which might be designed in a manner a trifle more informal than that chosen for the lobby proper, and when it can be arranged, a women's dressing room opening from the reception room should be included. Nothing adds more to the atmosphere of dignity and hospitality of a lobby than a chimneypiece and fireplace, always provided, of course, that neither chimneypiece nor fireplace be a sham, not too large in scale, and that the fireplace will be actually used. A certain well known hotel in Boston owes much of its charm to a bona fide fireplace in its hospitable lounge, where the guest feels sure a pile of blazing or smouldering logs will be found whenever the weather affords a pretext.

The dining room or restaurant of an apartment hotel is easily made so attractive that it might well be placed where a glimpse into it may be had from the lounge or lobby. The suitability of the English

A Spacious Arch Forms the Entrance to the Vestibule of The Belmont

The Spacious Windows of the Dining Room Are Decorated With the Typical Fan Motif of the Adam Style

styles for such a room has already been dwelt upon, but often in planning an apartment hotel the necessity of having a light shaft or court makes possible the utilization of the ground floor of the shaft as an alcove opening from the restaurant or dining room. Provided with a skylight, it might aid in lighting the dining room, and such an alcove might well be given a form of treatment which would render it of distinct architectural value. Were the dining room paneled in English fashion, the walls of the alcove might be faced with travertine, the floor paved with brick or tile, and against part of the ample wall space there might be built a fountain with overflow into a pool sunk in the floor. Such a detail would add much to the attractiveness of the dining room.

Where a ballroom is included in an apartment hotel an architect has an opportunity which may well challenge his best efforts. The ballroom in a large hotel, together with the other rooms which belong with it, should wherever possible have a separate entrance from the street, and when necessary have elevators which serve only the ballroom suite. A low ceiled antechamber leading into the ballroom may offer opportunities for a musicians' gallery above, or else it may be better to combine this with a small stage at one end of the ballroom. If space permits, a suitable supper or banquet room may be included, connecting with the kitchens. Dressing and coat rooms, which must be provided for women and men, may be entered from the vestibule of the ballroom suite. It is difficult to limit the imagination when it comes to dwelling upon the planning of the interior architecture of a ballroom suite. There exist many styles, all highly appropriate for such use, among which are the various French Renaissance types, with their mirrors, and their paneled walls, which may be painted cream, gray, blue, buff, or any one of many other colors, in soft tones combined possibly with gold. Ballroom floors, intended as they are for dancing, should be of hardwood, either inlaid or of narrow strips. The lighting may be from crystal chandeliers or wall candelabra which aid greatly in interpreting the character appropriate for a ballroom.

But even the most attractive planning of the public or semi-public rooms of an apartment hotel will not atone in the estimation of the guest or tenant for any shortcoming in the planning or arrangement of the residence suites themselves. It would seem to be the part of wisdom for the architect to plan these suites with great care and thought, incorporating every detail of planning and equipment which can properly be included, and to plan, as already suggested, with the aim to aiding the interior decorator and furnisher in creating homelike and really domestic interiors. This necessity for coöperation between the architect and the decorator is iterated and reiterated, since only when such coöperation is possible are the hotel owner and his guests or tenants properly served and really satisfied.

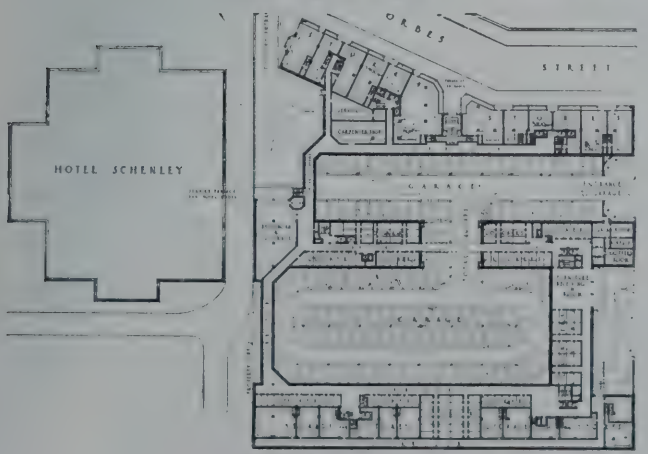
Lobby of The Lake Shore Drive Hotel, Chicago, Shows the Value of Ornamental Interior Architecture

Schenley Apartments, Pittsburgh

H. HORNBOSTEL and ERIC FISHER WOOD, Architects

FIRST FLOOR PLAN

NUMBER of apartments, 245; three to ten rooms each. Tenants permitted to prepare meals, or meals will be served from Hotel Schenley, which connects with apartment buildings. Kitchenettes in every apartment, equipped with sinks and wash trays, combination electric and gas ranges for cooking, frigidaires, garbage chutes and large store closets. Seven- to ten-room apartments include maids' rooms with toilets. No general servants sleep in any of these buildings. Construction: steel skeleton with concrete floors. Interior partitions: terra cotta and gypsum block. Exterior materials: gray brick and limestone. Work was begun September, 1922. Cost per cubic foot, 56 cents.



GARAGE AND SHOPS ON STREET LEVEL

PLAN OF THE TYPICAL APARTMENT FLOORS

Photos. Tebbs & Knell, Inc.

ENTRANCE TO THE GARDEN LEVEL FROM FORBES AVENUE

DRIVEWAY ENTRANCE ON FIFTH AVENUE

SCHENLEY APARTMENTS, PITTSBURGH

H. HORNBOSTEL & ERIC FISHER WOOD, ARCHITECTS

The Decoration and Furnishing of Public Rooms

By HOWARD MAJOR, *Architect, New York*

PRIMARILY, the apartment hotel is a home. It must be decorated as a home, with domesticity expressed at every turn. Splendor, magnificence and monumentality must be eliminated. The architect and decorator who confer this all-important character of "homeliness" will be well on the road to creating interiors that will prove a "selling" force in renting. This particular factor seems to be but little understood, and it is high time that those responsible for interiors and their furnishings awoke to its realization and discarded the set commercialism of the average apartment hotel.

After all, the problem is not more difficult than that of the home. Unfortunately, it is approached differently and without the careful, solicitous thought expended upon the latter. The usual method of procedure for the hotel is to have several large and financially responsible concerns submit estimates for furnishing from top to bottom. One of these bids is accepted, and the familiar commercial result follows. The bid and sketches submitted by the successful competitor are primarily for profit,—excellent business for the concern, but extremely bad business for the hotel. As such is the custom of all holding companies, we must expect "grand magnificence" in execrable taste until they are shown the error of their ways by better example.

In this important element of the apartment hotel problem the field is open, and cultivating it begins with the architect. It is his duty to impress the owners with the necessity of not only securing professional advice on decorating but also of paying for this artistic advice just as engineering fees are paid in the building operations. Then the architect must consult with the selected decorator and, long before the plans and specifications are prepared, determine upon the decorative scheme. That which is in vogue with people of culture should not only be considered but adopted, for where they lead others soon follow. Today we find such people universally adopting period, and correct period, interiors. The obvious course, then, is for the hotel to adopt the use of similar period interiors. Most hotel managements delude themselves into thinking they have taken this step, but the result is generally only a commercial caricature of architectural styles. Personally, I believe it is a physical impossibility for a successful hotel architect to thoroughly assimilate interior domestic period decoration, as it requires altogether too much meticulous study for a man whose other

The Dining Room of The Madison, New York, Combines Color in Ceiling, Hangings and Carpet with Walnut Paneling of Unusual Design and Occasional Mirrors in Ornate Settings

An Interesting Feature of the Park Lane Villa, Cleveland, Is the Circular Stairway with Wrought Iron Railing in Italian Style

problems are so varied and so intricate. If the architect realizes this, he will be well repaid by the results for securing the services of one familiar with this specialized branch of the profession.

Returning to the subject, after the interior styles have been agreed upon, the architect must endeavor, in designing the interiors, to avoid set, harsh results. As in the private house, search for quaint characteristics of the period, and introduce them with relish. Forget hotel scale, and resort to the small scale of the home. Keep detail undersized, for the tendency is usually the other way, particularly with architects of large hotels. Avoid stateliness and over-decoration. Modesty in architecture is as desirable as in personality. Avoid bizarre effects and the use of formal styles which are not appropriate. What excuse exists for Spanish or Italian Renaissance interiors with Georgian exteriors in our northern climate? One New York hotel went so far as to have an enormous lounge executed as an outdoor patio! Such ideas are not only vulgar, but most inappropriate; but although avoided by people of refinement, they are, after all, the type the average hotel man most admires and desires,—but later regrets! The various public rooms and lobbies should all be in the same period or in closely related periods, so that there is no jarring contrast as one progresses from room to room, and these periods should also be closely related to the exterior architecture. Glass doors separating rooms are as undesirable in the hotel as in the home. Let the designer assume that he is doing the large living or dining room of a private home, observing the same theories of design, and his success will be assured. In furnishing the same principle holds true. In selecting the color scheme, appropriateness to the period should be kept in mind, and quaintness and harmony in contrasting effects for walls and furnishings should be attempted. Avoid hackneyed color schemes, and introduce some personality in the tones and distribution of the colors selected.

In grouping furniture in the lounge, divide it up into intimate, informal groups. Here the ingenuity of the decorator may come into successful play. The average hotel grouping is as set as cast iron and as impractical for comfort, convenience and conversation. Nothing will so create atmosphere as the introduction of some antique pieces. I was surprised on dropping into The Gladstone apartment hotel in New York to discover the effect of "hominess" which the owner had obtained by filling his reception room with antique furniture and wall decorations. He explained to me that he had been frequenting auction rooms in order that his guests, on leaving their country homes for the winter in town, might not find themselves in alien surroundings. This work was done by an amateur who possessed correct fundamental ideas. Here is one apartment hotel owner who is striving for the "homey" note so very necessary to hotel comfort, with the result that he is repaid by a full house on top price leases.

Dining Room in The Alcazar Hotel, Cleveland, Furniture Copied from Italian Antiques

If the architect has refrained from over-decoration, the great amount of money saved will enable the owner to procure suitable wall decorations, such as seventeenth or eighteenth century decorative paintings, tapestries, etc. These, if well selected, will increase in value as the years go by and will further improve the home atmosphere which bare walls or architectural over-decoration invariably destroy. As in the private home, many small tables about the tete-a-tete groups add comfort and coziness and heighten the domestic atmosphere.

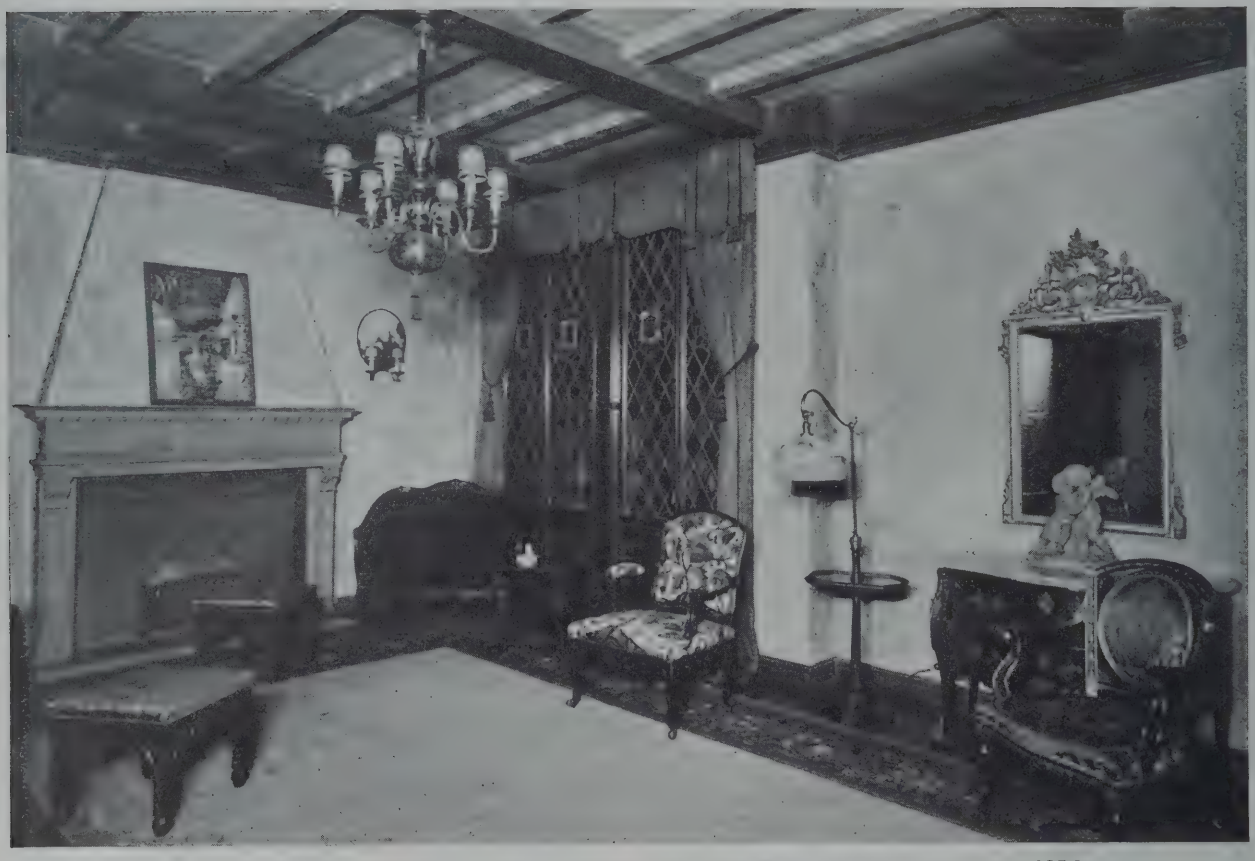
Probably the most garish feature in the usual hotel lounge is the ballroom-like lighting arrangements. Think for a moment; would you even consider for your own living room the lighting usual in an apartment hotel lounge? Then why not light the lounge in the far more attractive manner of the home by well distributed and balanced lamps, throwing a mellow and pleasant glow on the occupants? Furthermore, think of the unnecessary expense of these over-elaborate and generally ugly lighting fixtures! Probably 99 out of every 100 lounges would be greatly improved if they were stripped of this one feature. A word is not amiss concerning the enormous chimneypieces often seen in these rooms. An over-large chimneypiece is a grievous mistake as a creator of intimacy. As in detail, it is far safer to err on the side of smallness than on that of dominance. Much delightful character may be introduced in an otherwise characterless room by procuring an old chimneypiece of appropriate size, in either wood or marble. The possibilities of this idea are enormous. To sum up, the room must be handled in an intimate, cozy and if possible quaint, way from its architectural background to its smallest detail, such as ash trays, keeping constantly in mind the home living room as a model.

Homelike Atmosphere Is Obtained in the Foyer of The Gladstone, New York, by Use of Antique Furniture and Decorations

Antique Tapestries Are Used in the Entrance Hall of The Gladstone, New York

Although individual lighting of dining room tables is now well understood, many innovations may well be made use of for the service on the table. Color, for instance, may be introduced in the glassware, and period design and color for the china. Red or green damask table cloths would at once stamp a dining room as individual, and the effect of many small tables thus covered would be most striking. It is not difficult to secure a quaint antique side chair which could be easily reproduced for dining room use, rather than employ the poor stock substitute likely to be submitted by the commercial decorating company.

The apartment hotel operator is awake to this problem of successfully decorating the public rooms, but he is helplessly struggling with commercial decorating companies which are in business for profit alone. He hesitates to involve himself with those whom he considers "muddle brained" artists. The artist undoubtedly reciprocates in thinking of him as an uncultured barbarian. Their opinions are formed because of widely different training and ideals. They need each other, although judging from conditions the hotel proprietor is perhaps even more in need of the artist than the artist is of him!



SOFT TONED WALLS MAKE A BACKGROUND FOR FURNITURE OF DIFFERENT PERIODS

CHINESE WALL DECORATION FORMS A QUAINT BACKGROUND FOR EMPIRE FURNITURE

TWO ROOMS IN THE GLADSTONE APARTMENT HOTEL, NEW YORK

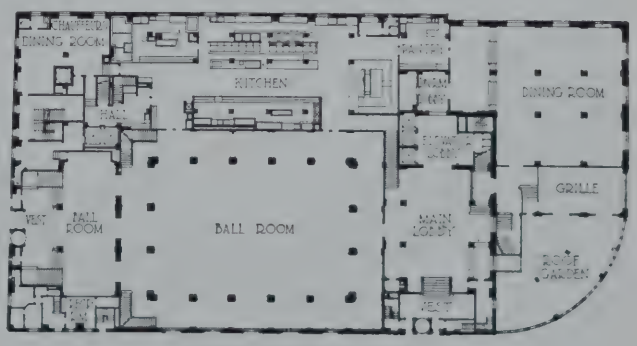
GEORGE F. PELHAM, ARCHITECT

Concourse Plaza Apartments, New York

MAYNICKE & FRANKE, Architects

NUMBER of apartments is 160, two to four rooms each. Tenants are permitted to prepare meals. Management serves meals in apartments as well as in main dining room. Apartments have small kitchens equipped with gas ranges, sinks, and kitchen cabinets having refrigerator compartments. Tenants secure maid service by the hour from the management. The dining and grill rooms seat 300. There are nine rooms for maids on the first and second mezzanine floors. Construction: steel skeleton with cinder concrete arches. Interior partitions: gypsum, with terra cotta blocks for stairways and elevator shafts. Heating: low pressure vacuum steam. Electricity is supplied by public service company. Elevators: electric overhead traction. Finish of cars: baked enamel on steel. Windows: wood, double-hung, except where steel frames and sash and wire glass are required by law. Portable vacuum cleaning, refrigeration for main kitchen and ice making are provided. Finish of main entrance lobby: oak and travertine. Floors in rooms: wood, except in kitchenettes, where cement was used. Work begun March, 1922. Cost per cubic foot, exclusive of architects' fees or cost of financing, was 67 cents.

TYPICAL FLOOR PLAN



FIRST FLOOR PLAN

Photos. Drix Duryea

MAIN LOBBY, LOOKING TOWARD ENTRANCE VESTIBULE

MAIN LOBBY, LOOKING TOWARD CORNER STAIRWAY TO THE KITCHEN

CONCOURSE PLAZA APARTMENTS, NEW YORK

MAYNICKE & FRANKE, ARCHITECTS

The Decorative Treatment of Furnished Apartments

By JOHN H. HUTAFF, *Interior Decorator, New York*

IN the problem of decorating and furnishing a hotel apartment one must take into consideration the private and social life that the tenant may wish to enjoy, entertaining his friends there as he would in his own home. The whole undertaking demands thought, guided by feeling, through the result of which the owners or occupants may receive comfort and satisfaction. One end much to be desired is that people who buy and use furniture and decorations, whether in their apartments or their houses, should acquire some knowledge of the general principles of interior decoration. Rooms should reflect good taste, decorative charm and a sense of repose. Naturally enough, the "home" note should be decidedly emphasized, especially in the living room, where the entertainment of passing friends is at once a duty and a pleasure. "Hospitality" rooms which are planned and equipped appropriately show, in the case of living rooms for instance, spaciousness and relative luxury, the aim being to provide rooms, which, while thoroughly comfortable and commodious for the home circle, will readily adapt themselves to the reception of formally invited guests or the sudden invasion of the unexpected. Success depends upon the translation of these requirements into terms of decoration and furnishing.

In decoration it is what one dares to do in color, quite as much as in design, that often gives the most effective interior. The use of color should be carefully considered and not confined to floor and furniture coverings and in a minor degree to walls, as so often happens. Colors must be used and distributed deftly, to emphasize and blend form, whether it be of chimneypieces, cornices or furniture. But let not the amateur rush in where the professional decorator would fear to tread, or the result may be fatal!

Rooms should have some architectural background, but not necessarily period architecture, because a close adherence to one period is likely to make the interior stiff and over-dignified where an atmosphere of home comfort and informality is most to be

Simplicity Marks This Balanced Arrangement. The Side Wall Panels Are Blind Doors to China Closets
John H. Hutaff, Interior Decorator

Dull Gold Ceiling and Walls Contrasted with Brown Velvet Hangings and Italian Furniture

desired. Why shouldn't we be awakened and inspired, however, by touches and suggestions of that wonderful epoch, the eighteenth century in France and England?—by suggestions recalling memories of old rooms, which preserve the very essence of the art and charm of that epoch in which good taste seemed to have been almost a matter of instinct?

Of recent years the interest taken in the furnishing of apartments has so greatly increased that it is now more necessary than ever to pay careful attention to the character and quality of the details. Although much has been written about the decoration and furnishings of residence apartments, very little has been said about the hotel apartment, which has become an important part of our daily life, since so many people are making hotels their homes. In decorating and furnishing such apartments, the first thing to be considered is good taste. This is the fundamental quality for which to strive, no matter whether the work has to be done economically or without regard for cost. Quiet simplicity, often obtained at as great a cost as ostentatious display, is always pleasing and satisfying, but it should be achieved through a discreet handling of materials and furnishings; otherwise the effect may be cold and depressing. Many rooms are devoid of all feeling and asmosphere, because of harsh and inhormonious color combinations and the thoughtless arrange-

Walls Are Painted Gray-Green; Panel Mouldings Picked Out in Dull Gold; Linen Hangings at Windows

John H. Hutaff, Interior Decorator

ment of the furniture, which might have been good.

When we enter a room we wish to find the home touch,—that intimate quality which suggests hospitality. This quality may be obtained by interspersing a few antique chairs, tables and lamps of good design among comfortable, modern upholstered easy chairs and couches. Carpets covering the entire floor, which are again in vogue, as well as reproductions of old French and English papers for the walls, especially in dining rooms and bedrooms, give an atmosphere of homelike informality. Painted walls paneled with wood mouldings, and hardwood floors of oak, chestnut or birch, are equally popular. Color schemes can be worked out attractively with carpets and wall papers as well as with imported rugs and painted walls. Where figured wall papers are used, the hangings and carpets should be monotone, either without figures or with simple figures or designs in two tones of the same color. Some of the reproductions of old Victorian wall papers show simple and formal designs in varying shades of one color, with which highly colored decorative chintzes and printed linens may be successfully and pleasingly combined. Some of the smaller chairs and couch cushions should be covered with the material used for the hangings, in order to tie together the whole decorative scheme. Large armchairs and couches should usually be upholstered with plain materials of a color in har-

Window Hangings in This Apartment Room Are Chinese Blue Brocade Against Buff Painted Walls

Balanced Arrangement of Pictures, Ornaments and Furniture Gives Dignity and Repose to This Living Room
John H. Hutaff, Interior Decorator

Ship Pictures and Antique Furniture and Ornaments Give a Personal Quality to This Room

monious contrast with the coloring of the walls, hangings, rugs or carpet. If velvet or velour is used for the hangings and the covering of part of the furniture, it often gives a pleasing note of contrast, in an informal living room, to upholster two chairs, or a chair and a bench or stool with chintz or printed linen. The unlimited number of attractive fabrics of every description produced of late years leaves no possible excuse for failure to combine materials harmoniously and attractively in any decorative scheme. Block printed linens as well as chintzes, which have never been better in color and design than today, are among the many materials being extensively used for decorative effects.

Great progress has been made in recent years in the development of wall treatments. Not only is there a variety of pleasing designs for the use of wood and plaster mouldings to form panels of various shapes and sizes, but there are also many different wall effects to be had through the type and handling of the plaster itself. Painted, paneled walls are very attractive if well done, and well thought out, but they have been overdone in some cases and badly done in others, especially in smaller houses and cheaper apartments, where often no thought, from an architectural standpoint has been given to the arrangement of the panels because the work has been done by carpenters who know nothing about architecture or decoration. There are many types of plastering, ranging from the smooth, eggshell finish, which is essential if wall paper, canvas, burlap or other such materials are to be applied to the wall, to the very rough sand or "carpet float" finish. This latter treatment can be carried out with only two coats of plaster, as the third or finish coat is not necessary. One of the most popular plaster finishes is the "antique Italian," produced by a crude and rough application of the third or smooth finish coat. Antiqued plaster when properly finished and glazed will give a warm and mellow wall, well suited as a background for tapestries and antique decorative paintings. Old portraits, ship pictures, paintings of still life, flowers and architectural subjects make interesting notes of color for overmantel or wall decorations. Old paintings of uniform size and color may be effectively used as mural decorations when set into wall or overdoor panels. Architectural and landscape wall papers, which are used extensively in private apartment dining rooms and halls, give an intimate and homelike atmosphere. Carefully chosen sections from these same papers make excellent decorations for wall panels when glazed and antiqued, giving much the same general effect as paintings.

There are to be had today many attractive wall coverings, such as the reproductions of Colonial papers found in old houses in Portsmouth and Salem, and the interesting architectural and landscape papers reprinted from old French and English blocks cut over a century ago, which make most attractive wall decorations. These papers cover a wide range of subjects as well as colors, some showing as many as ten colors, while others are in two tones of the same color. It is always possible to use these papers appropriately and successfully as a part of a studied color scheme. Harmony and color in the decoration of a home are always refreshing, for they give an atmosphere of repose and warmth to any room.

In the rooms of an apartment hotel space is likely to be limited, and every advantage should be taken of ways of arranging furniture to create an effect of space. This may sometimes be done by placing furniture so that the center of a room is unobstructed, and sometimes by leaving ample areas of wall free of pictures or other ornaments. Every effort should be made to secure an appearance of richness, dignity, simplicity and character.

In furnishing interiors in buildings of the apartment hotel type much dependence must be placed upon color. The arrangement of these structures almost invariably necessitates planning rooms not particularly well lighted, and many rooms must face interior courts. Under these circumstances use should be made of colors which make the most of what light there is or which create brightness and cheer. Americans as a rule are afraid of the use of color, and yet its discriminating use is at the root of all really successful decoration of any kind, and more study of it should be made.

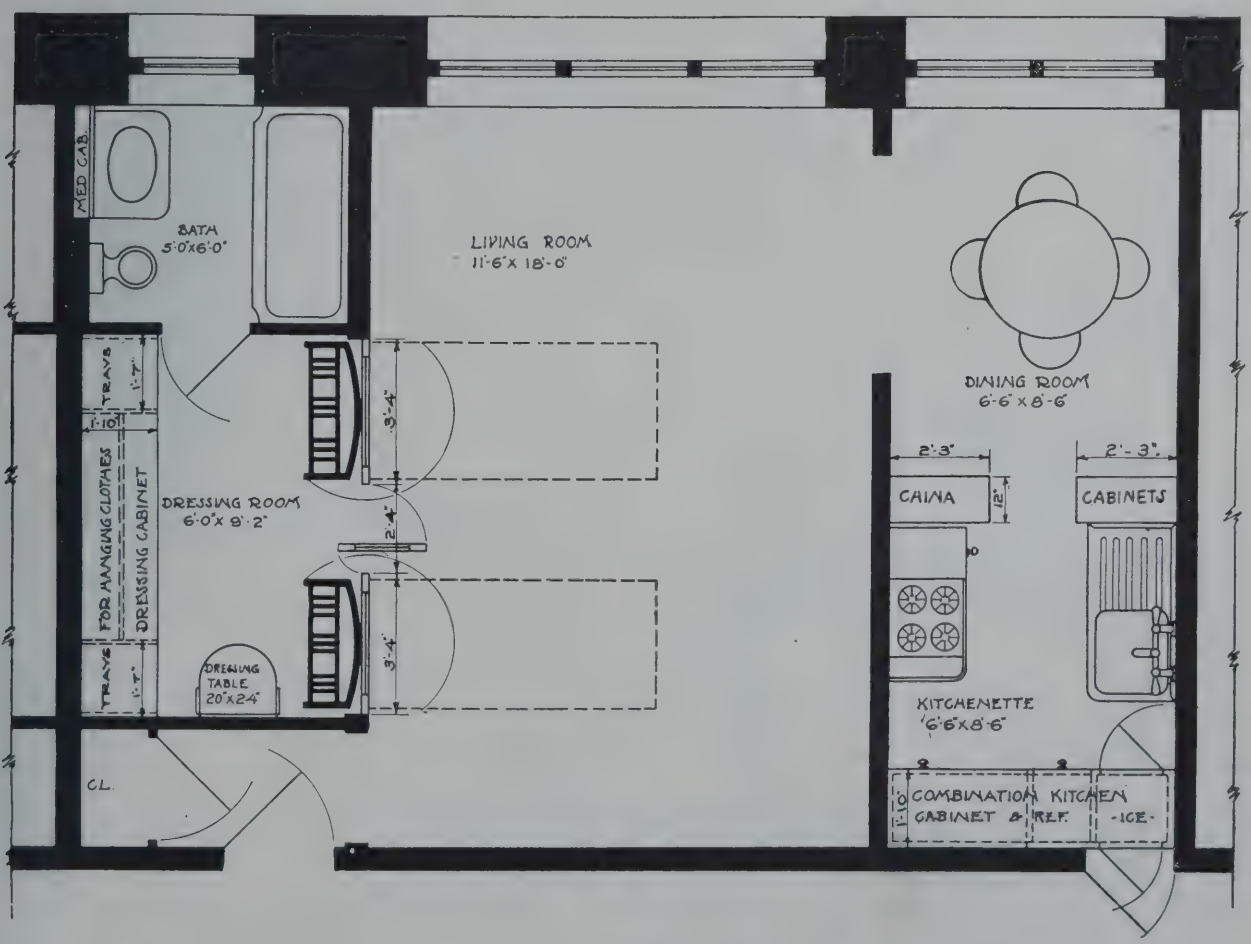
Efficiency Planning and Equipment

By C. STANLEY TAYLOR

AN analysis of the fundamental trends of modern apartment hotel planning and equipment would not be complete without careful consideration of the "efficiency" apartment idea. Known for several years on the Pacific coast and in the middle western states, this system of apartment planning has recently come into high favor in the eastern states, particularly in the New York metropolitan area.

Briefly, efficiency planning may be defined as the arrangement of comfortable facilities for living within comparatively confined space in a modern apartment building. This result is accomplished by the provision of double-utility rooms, with the partial or complete elimination of bedrooms through the use of "door beds" and other forms of special equipment described in later paragraphs. The demand for this type of planning is the result of high land and building costs which have enforced high rentals in modern apartment buildings, often beyond the purse-reach of tenants who wish to live in comfortable and attractive surroundings. To this problem there has been but one solution. Builders and their architects have been forced to study ways and means for increasing the rental value of each square foot of apartment space by planning the apartments so that tenants may have complete and attractive living facilities within a smaller floor area than that to which they have been accustomed in the past. Thus the efficiency plan, which has been adopted for many of the finest apartment and apartment hotel buildings in this country, has been developed to meet a specific need from both owners' and tenants' viewpoints. It is an answer to a popular demand.

A study of the accompanying plans will show that the basis of efficiency planning is two-fold: first, eliminating or combining rooms so that the same space serves two purposes; and, second, arranging for full kitchen and dining room service within a limited area of floor space. Thus a one-room apartment is provided which has the facilities of living room and bedroom in the same space, with bath, dressing room and kitchenette as a complement. Two rooms may be living room and dining room,



Plan of Typical "Efficiency" Apartment Showing Double Utility Space, Compact Arrangement and the Usual Equipment

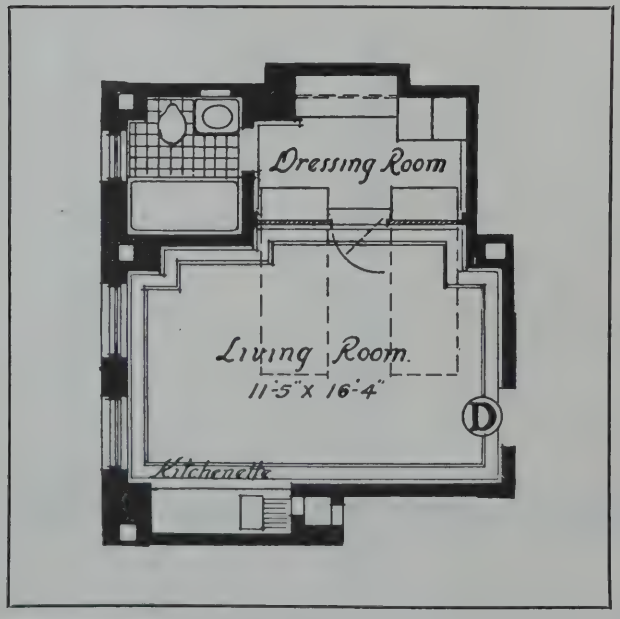
A Living Room by Day

A Bedroom by Night

In the "Efficiency" Plan One Room Serves Two Purposes

sun room or library by day, and bedrooms to accommodate four persons at night, with one or two baths, separate dressing rooms and a completely equipped "dinette" or combination kitchen and dining alcove. The important consideration from the viewpoint of the architect is that the adoption of complete or partial efficiency planning often results in favorable consideration on the part of an owner who has found that investment in an apartment building under the ordinary method of planning does not show a high enough rental income to justify proceeding with the project under present conditions resulting from high material and labor costs.

To illustrate the comparative possibilities of efficiency planning, there will be found on page 255 a graphic comparison of the old and new planning methods. These plans are of buildings which have been actually constructed in New York on lots of practically the same dimensions. Plan A is that of a building built several years ago, and represents an early step in efficiency planning which conserves the space allotted to each individual apartment by eliminating the dining room and providing a large living room which functions in both capacities. This represents a method of planning which has been adopted for many large apartment buildings and which has been proved fairly successful, although many tenants do not like the idea of eating in the living room. Plan B is that of a building just finished in New York, and represents a typical full efficiency plan in which bedrooms have been eliminated through use of door beds and dressing rooms; the kitchen has been developed on a compact plan, and eating facilities are provided for some apartments in dining alcoves, while for the one-room apartments small kitchenettes are built in. These buildings contain approximately the same square footage per floor. In the building represented by Plan A, this space is subdivided into four apartments, for which the room and rental figures are given here. For purposes of comparison, the rentals for both plans are established in the same location.



Need for Special Bed Closet Obviated by Combining It with Dressing Room

Front apartment, consisting of living room, kitchen, foyer, two bedrooms and bath and extra lavatory; the rental is.....$2,400.

Front apartment, consisting of living room, kitchen, foyer, two bedrooms and bath and extra lavatory; the rental is.....$2,400.

Rear apartment, consisting of living room, bedroom, kitchen and bath; rental is....$1,600.

Rear apartment, consisting of living room, bedroom, kitchen and bath; rental is....$1,600.

Total Rental Per Floor.....$8,000.

Plan B, within approximately the same perimeter, provides these seven individual apartments:

Front apartment, consisting of living room, bedroom, dressing room with two door

beds (which convert living room into bedroom at night), foyer, bath, kitchen and dining alcove; rental is..... $2,900.

Front apartment, consisting of living room, dressing room with two door beds (for converting living room into bedroom at night), bath, foyer, kitchen and dining alcove; rental is..... $2,400.

Two left-center apartments, each having living room, dressing room with two door beds (which convert living room into bedroom at night), bath and kitchenette, each renting at $100 per month; rental is.... $2,400.

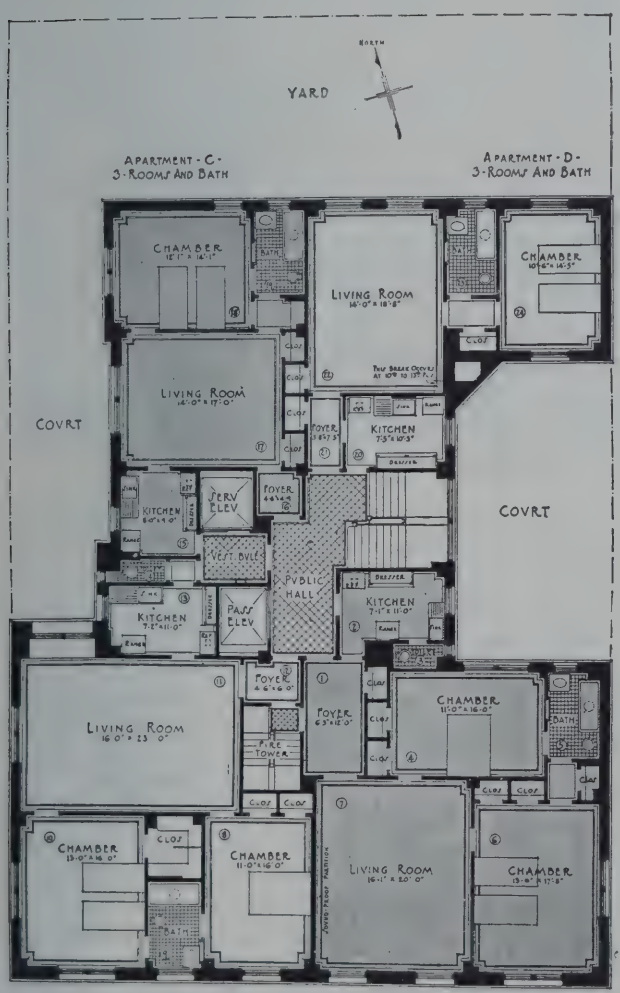
Central-right apartment, consisting of living room, dressing room with two door beds (which convert living room into bedroom at night), bath, kitchenette and dining alcove; rental is..... $1,600.

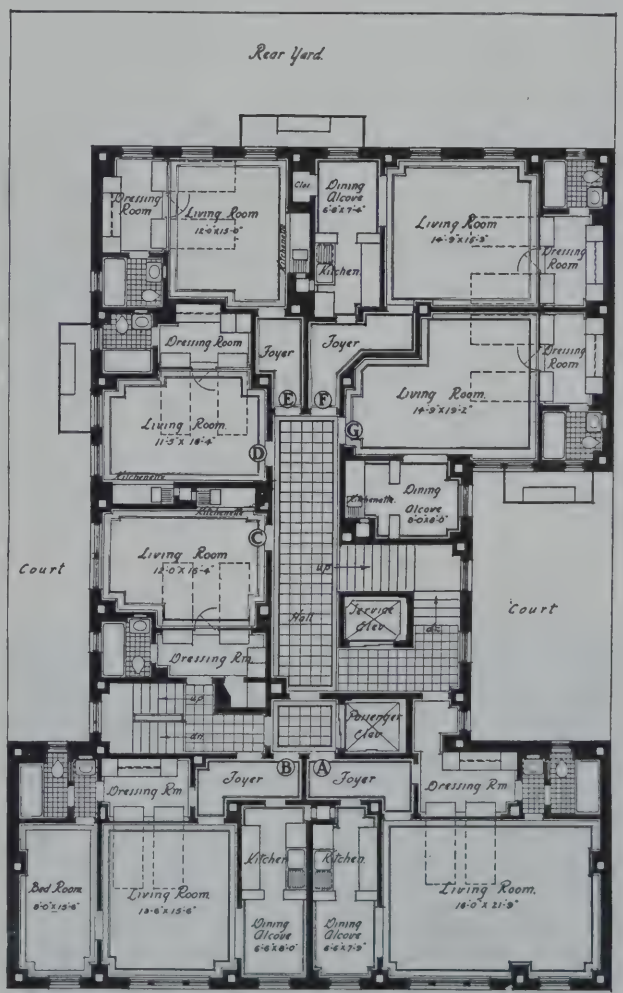
Rear apartment, consisting of living room, dressing room with two door beds (which convert living room into bedroom at night), bath and kitchenette; rental is... $1,300.

Rear apartment, consisting of living room, dressing room with two door beds (which convert living room into bedroom at night), bath, foyer, kitchen and dining alcove; rental is..... $1,800.

Total Rental Per Floor of Same Area as Plan A.....$12,400.

This comparison shows that in two buildings on the same sized lots and with approximately the same perimeters the rental income under the efficiency method of planning is $4,400 more per year per floor, or in such an eight-story building approximately 7½ times; this amount represents the additional yearly rental to be gained under the efficiency method of planning. Perhaps the rentals established for these plans will be questioned, and it may be considered that rentals shown for Plan B are high in comparison with those in Plan A. Practical experience has proved that this is not true, and the reason for this may be seen by considering the two buildings from a tenant's viewpoint. In leasing an





Comparison of "Regular" and "Efficiency" Planning

Plan A

This plan represents a first step in efficiency planning as developed a few years ago. The effort then in space-saving was confined principally to the elimination of dining rooms and the arrangement of the apartments in compact grouping of rooms. On each floor there are four apartments, providing a total rental of $8,000 per year, as described in the accompanying article

Plan B

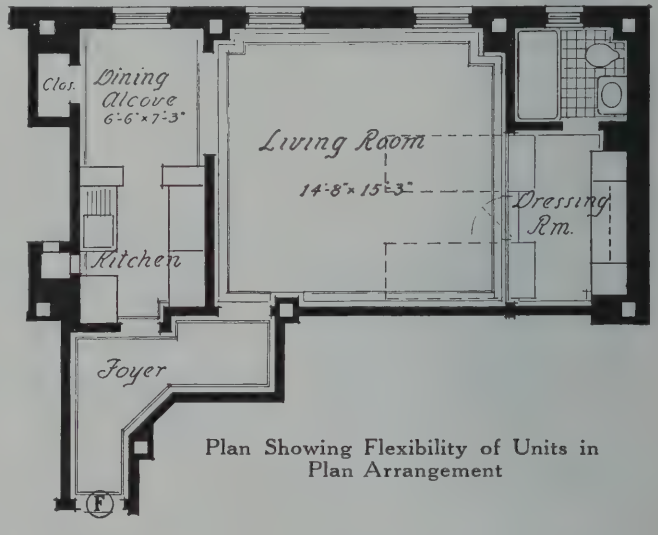
A modern efficiency plan developed upon a lot of approximately the same size. This plan provides on each floor seven apartments at a total rental of $12,400 per year, and with only a comparatively small increase in the cost of the building. Here the "double-utility" space idea is carried out fully or partially in each apartment by means of door beds and other equipment

Typical Dressing Room Cabinet

apartment in Plan A, the tenant is paying rent for a considerable amount of space which is used only at night. It is necessary also that the tenant shall completely furnish such an apartment, which means purchasing complete bedroom furniture for one or two bedrooms as well as furniture for living room and foyer. In renting an apartment in Plan B, it is necessary for the tenant to furnish only the living room and the foyer, and sometimes provide table and chairs for the dining alcove, because under the efficiency planning and equipment method the concealed beds are already installed with box springs and mattresses; the furniture for the dressing room is built-in; a complete kitchen is built-in with a china closet for the dining alcove, and sometimes table and benches are provided in the dining alcove. This means that the tenant has to make a much smaller investment in furniture, the difference in cost often being considerable.

In comparing room sizes in the two plans, the living rooms in A are somewhat larger than built in B, but not enough larger to make a great difference from a tenant's viewpoint. The cost of constructing and equipping the building represented by Plan B is somewhat greater than with Plan A. There are more bathrooms in B; there is more interior construction, and there is the additional cost of the built-in equipment. This additional cost, however, is far more than offset by the higher rentals and by the fact that it is easier to rent apartments in the house with Plan B as they range as low as $1,200 a year and offer a wider choice to the tenant; a greater range for selection is offered.

It is obvious that an owner of a high priced lot might analyze Plan A and find that with present building costs he is not justified in going ahead with such a project because he cannot get a high enough total annual rental. When he has Plan B as an alternate his decision may be changed entirely by the greatly increased rental which can be obtained. He realizes that the maintenance costs on these buildings are approximately the same and that the element of depreciation is not greatly increased, if at all, by the use of the built-in furniture. He will figure that heating and upkeep will be slightly more expensive with Plan B, but here again he has the factor of greatly increased rental income as an offsetting consideration. This information, together with these illustrations, will serve to demonstrate for the architect the important economic and planning factors involved in laying out this type of building. It is obvious that where an architect wishes to make comparisons of income on the old and new types of plans he has but to make rough layouts and take them to experienced real estate rental managers for opinions as to rental values and demand for such space in the different communities.

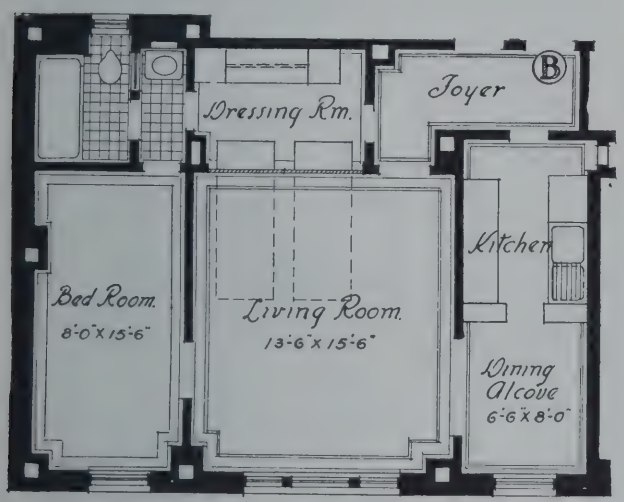


Plan Showing Flexibility of Units in Plan Arrangement

There is another highly important consideration which directly affects the planning of efficiency apartments. Needless to say, a considerable variety of space-saving and utility equipment has been developed to be built into apartments of this type. It will be interesting, therefore, to describe briefly some such details of equipment as may be available for various rooms and utility purposes. The first

Efficiency Apartment in the "Bolton Square," Cleveland

problem is that of service to the apartment. Deliveries to be made may be divided roughly into two classes; the first, what might be termed front door delivery, includes mail, outside packages and parcels from laundries, while the second class consists of kitchen deliveries, such as ice, groceries, etc., and includes also the removal of garbage and rubbish. For the front door deliveries there is an interesting type of service door such as that used in some of the Statler Hotels, which consists of a hollow door having a large enough space to take laundry parcels, clothes, mail, packages, etc. This door has a smaller outside door which opens for delivery into the containing space but which does not allow entrance into the apartment. Deliveries can be made through this door, and the tenant can remove packages through an inner door without opening the main door at any time. This type of door also has special ventilating features which recommend it. An alternative to this method, although at times a waste of space, is the small foyer located at the main



The "Partial Efficiency" Plan

entrance or at a second entrance to the apartment. For the delivery of ice and groceries, as indicated in the plan on page 253, a special kitchen door with small doors opening directly into the ice box or a delivery box may be provided. The removal of garbage and rubbish is accomplished either by the built-in incinerator, which if properly constructed is an excellent feature, or by a small iron receptacle set in the kitchen wall so that access may be had to remove the garbage pail from the service hall without the garbage remover's having to enter the kitchen or even make his presence known.

For the kitchen special types of wood or metal cabinets have been designed, some of which are hung on the wall to save floor space. Such a cabinet is usually located over range, ice box, sink or other equipment. Another type of equipment for the kitchen may be had in complete units, which include kitchen cabinets, ice box, a small gas and electric range and dish closets, compactly designed as one piece of kitchen furniture. For individual

A Typical "Dinette" Unit

gas stoves, there have been introduced within recent years very interesting improvements in compactness of cooking arrangements. Ranges will be found with smooth iron tops, easily cleanable and kept warm with one burner. Other types have double-utility ovens in which the gas burners are located at the bottom of the oven with lids and may be used for auxiliary cooking purposes. For the kitchen there will also be found special broom and ironing board closets, ready to be built into the wall. These contain storage spaces also for electric irons, mops and other household equipment. In the kitchen also there should be at least three outlets for electrical equipment, an outlet for the electric iron being placed in the ironing board closet, and outlets at other convenient points relative to kitchen cabinet or the culinary table. Interior finishes and flooring for kitchens are discussed in the article by William L. Rouse in this issue of THE FORUM. The door beds need no description other than given graphically. It might be noted, however, that these beds have been developed to a point where they are quite as comfortable as the ordinary type of bed, and carry box springs and mattresses in a similar man-

The Kitchen Complete in All Details

Door Beds Concealed in Dressing Room

ner. They are installed with perfect balance which requires no effort to move them up or down and from one room to another. The dressing room also calls for specially designed built-in furniture. This is available in the form of dressing tables which can be attached to the wall, and large clothes cabinets such as that illustrated. Bathrooms are planned and equipped in the ordinary way. The "dinette," or the small dining alcove, is usually provided next to the kitchen and is separated from it by specially designed built-in china closets such as that illustrated. Dining room furniture is usually of the smaller or "breakfast room" type, but it may also be noted that for this room there are available built-in tables and benches which fit into spaces in the wall when not in use.

From a business viewpoint, efficiency planning long ago ceased to be an experiment, at least on the Pacific coast and in the middle west. In the eastern states public acceptance of this type of planning has been slower to develop, primarily because of the established conservative attitude toward radical changes in structural methods and the planning of residential projects, and also because it was affected by difficult provisions of building codes in such cities as New York, Boston and Philadelphia, which to a considerable extent have been overcome in the apartment hotel field because this class of building is removed from jurisdiction of the Tenement House Law in New York and some other eastern cities. Perhaps another reason that efficiency planning has only recently been developed generally in the east is because transportation facilities are so good in eastern states that large areas of outlying land have been developed for apartment house projects. This has meant low land cost which allows more building space under established rentals. Throughout the better districts in the cities and suburbs land values have been steadily rising in the last few years and have finally reached a point where serious consideration must be given to this element as well as to that of high costs.

The differential of rental gained by the use of the efficiency system of apartment planning is difficult to express in exact figures, because of the wide variations of rents in different sections of the country and even in adjoining localities. Figures which have been selected from various operations of this nature would seem to indicate that the rental income from a given number of square feet of rentable apartment space can be increased approximately one-third by the introduction of the double-utility element in planning and equipment. The additional cost of the original investment which is necessary to take care of the increased volume of partitions, heating equipment, bathroom finish and equipment and other increases necessitated when more families are housed on one floor, seems to approximate 5 per cent of the total cost of the building. Even if this were 10 per cent it would seem a wise investment, if the income can be increased one-third by the introduction of this system of planning.

While efficiency planning was in its early stages, and until very recently in the eastern section of the country, there existed decided opposition on the part of mortgage interests. This situation was probably a reflection of the conservative attitude of the average banker, which does not encourage innovations, and requires assurances of experience to prove that such a radical change in housing methods is not a temporary trend or fad, but that it represents the true answer to a definite demand on the part of the public. As a criterion of the soundness of this method of planning apartment buildings it is to be noted now that mortgage loans are being made on structures of this type through very conservative sources in building estates, insurance companies, and large mortgage bond houses and other interests.

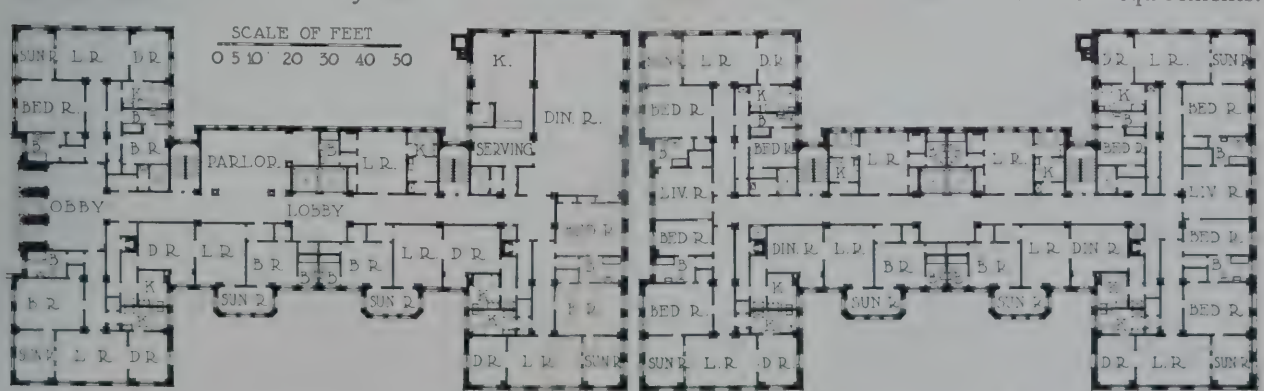
How Door Beds are Operated

Highland Plaza Apartments, Birmingham, Ala.

DENHAM, VAN KEUREN & DENHAM, Architects

CONSISTENT USE OF COLONIAL DETAIL RELIEVES THE SEVERITY OF DESIGN

EXTERIOR walls, hollow tile faced with Harvard brick trimmed with limestone. Construction, reinforced beam and slab concrete. Heating, vapor steam. Electricity supplied by public service company. Elevators, overhead traction type; cars entirely steel. Windows, wood frame and sash, double-hung; generally steel in stairways, elevator shafts and kitchens. Entrance lobby floored with rubber tile; corridors, concrete with carpets over. Dining room, oak walls. Elsewhere, walls plaster painted to imitate Caen stone. Cost per cubic foot, approximately 52 cents. Work begun June, 1923. Plan shows several types of apartments, housekeeping and non-housekeeping. Small bedrooms have connecting doors making possible a flexible arrangement of suites to suit the tenants' various requirements.



GROUND FLOOR PLAN

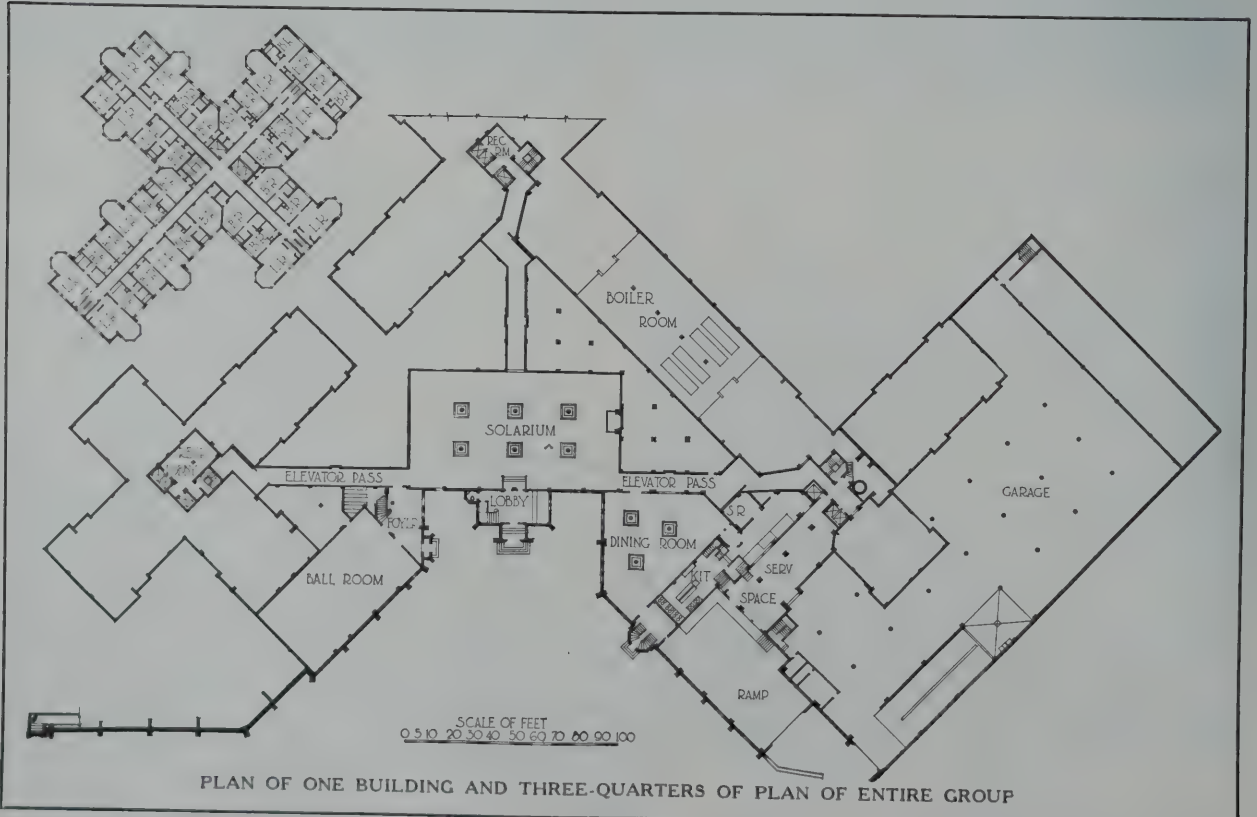
TYPICAL FLOOR PLAN

Alden Park Manor, Brookline

K. M. DE VOS & CO., Architects
HAROLD FIELD KELLOGG and GEORGE R. WIREN, Consulting Architects

THREE APARTMENT BUILDINGS CONNECTED BY LOW TWO-STORY STRUCTURE, ALL IN ENGLISH TUDOR STYLE

THREE buildings are connected by low, two-story structure containing ballroom, lounge, dining room, grill, kitchen, storerooms and garage, all constructed of reinforced concrete. Exterior, brick with stone trimming. Windows, steel sash and frame. Floors, waxed cork over concrete. Trim and baseboard, steel, wood paneling; plaster walls, brackets and cornices throughout. Oil-burning boilers; vacuum steam heat, no automatic control. Portable vacuum cleaning. Mechanical refrigeration. Cost per cubic foot, $1.20. Work begun April, 1924. Number of apartments, 240; two to seven rooms to each apartment, including kitchen. Meals served by management in suites if desired.



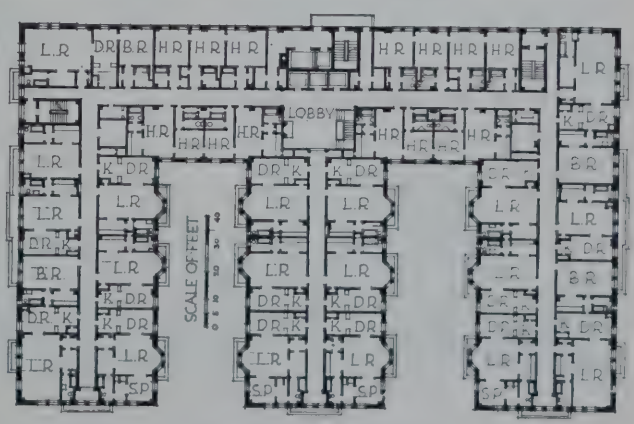
PLAN OF ONE BUILDING AND THREE-QUARTERS OF PLAN OF ENTIRE GROUP

Hotel Pennsylvania, Philadelphia

CLARENCE E. WUNDER, Architect

EXTERIOR, limestone for lower stories, buff brick with terra cotta trimming above. Six hundred rooms and baths, divided into 140 single rooms, each with bath, available for either transient or permanent guests, and 160 rooms arranged in suites of from two to six rooms. Rooms provided on top floor for tenants' servants. Every apartment provided with kitchen, equipped with gas range, refrigerator, dresser, storage closet and broom closet. Delivery receptacles connect with hotel corridors. Kitchens and dining rooms are separated by china closets extending half the height of the rooms; meals served from main kitchen to all rooms, as well as in main dining room. Commissary department provided in basement for convenience of tenants having housekeeping apartments. Power plant in separate building.

PLAN OF THE ENTRANCE FLOOR



TYPICAL FLOOR PLAN

FURNISHINGS IN THE ITALIAN STYLE RELIEVE THE AUSTERITY OF THE LOUNGE

TREATMENT OF DINING ROOM SHOWS A DIGNIFIED USE OF CLASSIC DETAIL

HOTEL PENNSYLVANIA, PHILADELPHIA

CLARENCE E. WUNDER, ARCHITECT

Gaylord Apartments, Los Angeles

WALKER & EISEN, Architects

THIS high class apartment hotel has large lounge and solarium, occupying together 4256 square feet of the first floor with an attractive garden in rear, but no general dining room is provided for tenants. Each apartment has a small dining alcove and interior kitchen, provided with gas range, sink, broom closet, garbage chute and liberal shelving. In about half of the apartments the living room serves at night as a bedroom, by the use of door beds and bed closets. 163 rooms are divided into two-, three- and four-room suites. No servants sleep in the house. Construction: Class A, reinforced concrete. Interior partitions: gypsum blocks. Floors: removable steel pans, cement finish for floors with wood strips embedded. Floors covered with carpets throughout. Windows: wood, double-hung. Heating: steam. Portable vacuum cleaning equipment supplied. Work was begun January, 1923. Cost per cubic foot was approximately 75 cents.

FIRST FLOOR PLAN

TYPICAL FLOOR PLAN

THE FOUNTAIN AND ITS BRONZEWORK IN THE SOLARIUM, DESIGNED BY OSCAR BACH

VIEW OF LOUNGE, LOOKING TOWARD DOORWAY INTO MAIN LOBBY

GAYLORD APARTMENTS, LOS ANGELES

WALKER & EISEN, ARCHITECTS

Food Service in Apartment Hotels

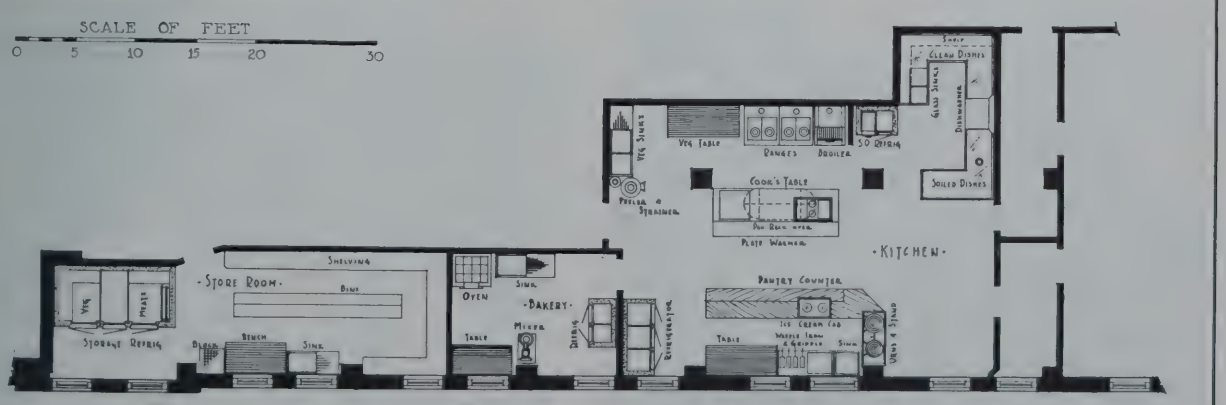
By ALBERT E. MERRILL
Equipment Engineer, Chicago

THE designation "apartment hotel" has been stretched to cover nearly every type of hotel building, whether exclusively devoted to apartments or to accommodation of both transient and apartment patronage. Therefore the discussion of the kitchen really means a study of the hotel kitchen in all its branches, and the same variations occur in dining room and service facilities. There are apartment hotels with from 60 to 75 apartments which either have no main kitchens at all or else lease basement rooms for restaurant purposes, while in the larger examples, such as the new Walker Hotel in Washington, 1,000 transient rooms are combined with several hundred apartments where dining room service is most elaborate and complete in every respect.

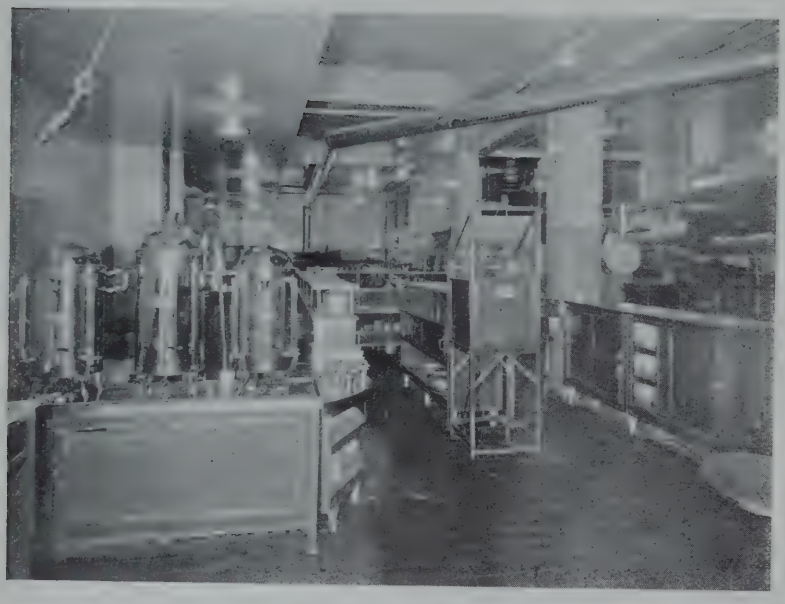
An examination of 12 of the more recent buildings, which have a combined room capacity of over 3,000 or an average of 250 per hotel, shows several interesting facts. The average main dining room seating capacity is equal to the number of rooms. Seven out of the 12 have elaborate banquet halls. Seven also have popular priced lunch rooms. One only subleases the restaurant space, all the others being operated by the hotel. In only one instance was arrangement made for two dining rooms in the same building to be operated at the same time. From this it may be gleaned that the dining room is regarded as a necessary hazard to the apartment hotel owner,—something which he cannot exist without, but which he feels sure will be operated at a loss. In fact, in certain cities and districts, as in New York, the restrictions of building and fire protection codes practically define apartment hotels as buildings operating restaurants and kitchens and with no real kitchens in the private apartments. These buildings do not come directly under the jurisdiction of the tenement house laws with their onerous requirements of numerous smoke towers or enclosed fire escapes. For this reason many owners of elaborate apartment buildings which are planned for subdivision into small apartments adopt the apartment hotel idea with a basement restaurant and no real kitchens in the apartments, but with large "serving pantries" which have actually the requisite facilities for private cooking. Thus to meet the demands of a new mode of living or the practical requirements enforced by building regulations the apartment hotel has been established as applying to a special type of building in which restaurant service must be maintained. The problem of the management is to make the restaurant service pay at least enough to carry its cost and share of space in the building, to prevent its being a heavy burden.

Of the group of hotels analyzed, seven have met this problem by the establishment of popular priced lunch rooms as adjuncts to the regular building service. Of course the location of the building primarily predetermines the feasibility of such a venture, but it may be assumed that the average apartment hotel is located in a thickly populated district, logical for such lunch room service. The tendency in equipping these rooms seems to be toward very elaborate and costly construction and the most ornate and decorative counters fitted with stools provided with upholstered seats and cane backs. Such rooms should always have street entrances as well as lobby entrances, with direct access to the main kitchens in order to prove profitable.

"Coffee Shop" is the name which has been recently given to hotel lunch rooms, and these, as well as other popular priced dining rooms, are really separate institutions in themselves. They require special fixtures for all food preparation except the few entrees which are secured from the main kitchens. The greater part of the food is cooked to order,



Kitchen Plan for Small Apartment Hotel (The Aragon, Chicago)



Kitchen in The Pearson Hotel, Chicago

and short order ranges are a wonderful and varied item today. Sometimes they are built over 30 feet in length, including steamers, steam tables, egg boilers, toasters, broilers, cake griddles, waffle irons, range ovens, top burners, coffee urns and many other cooking conveniences, all combined in one fixture. Such fixtures are a necessity, not a fad, as they promote the idea of rapid service and sanitary food. They are always built of the finest materials, their sides being of tile or porcelain, the framework of nickel silver covered metal or polished brass bars, and they are covered with attractive hoods of expensive design, all shelves and serving stations being made either of nickel silver or planished iron. They are so located that as the customer sits at the counter he is able to see his own order prepared from the breaking of the egg to placing of it on the plate or in the cup. The "Coffee Shop" idea seems to have completely uprooted the dairy lunch and cafeteria service of a few years back, and along with it the grill or grill range has replaced the long steam table.

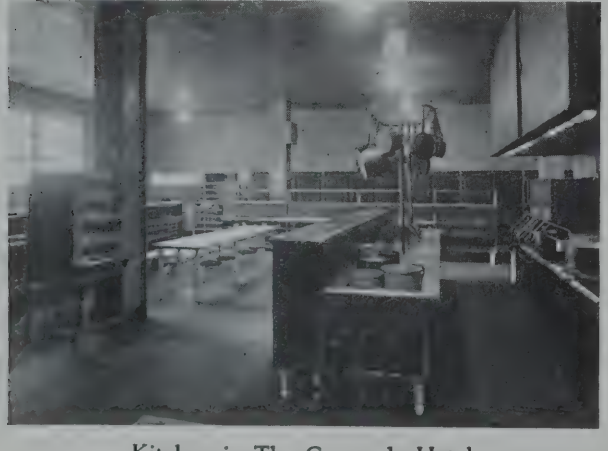
Economy of space is of the utmost importance in this type of lunch room, so we find centralized fixtures for serving water, milk, cream and butter, and combination urns combining the hot water urn and coffee urn in one. A width of room which permits the horseshoe counter with the short order grill at the end is preferable to the long, narrow space which permits only a straight counter on one side. Tables and chairs to seat as many as the counter will accommodate are generally included along one side or in an alcove.

Assuming that the hotel has 200 apartments, the main dining room should seat 200 people. It should be a room of approximately 4,000 square feet. About the same amount of space is the minimum necessary for a kitchen including bake shop, dish pantry *garde manger* and pantry service in addition to the main food preparation room with store room space and locker rooms for the various employes.

If the hotel specializes in banquet and tea room service, suitable serving pantries must be provided for each such room and contain the necessary fixtures for serving hot and cold ready prepared dishes, hot and cold drinks, and pastry. All short orders are prepared in the main kitchen and served from there. In case a specialty is made of banquets, the fixtures are naturally very complete, with many shelves and as much serving space as possible to facilitate rapid service and accommodate a large number of waiters at one time.

The same general rules that apply to any commercial hotel apply to the size and selection of equipment for the apartment hotel* except that dining rooms are generally somewhat smaller in proportion to the sizes of the buildings, and the kitchen requirements proportionately less. A great deal in the way of

*See article "The Planning and Equipment of Hotel Kitchens," by Albert E. Merrill, in the Hotel Reference Number of THE FORUM, November, 1923, for a complete discussion of this subject.



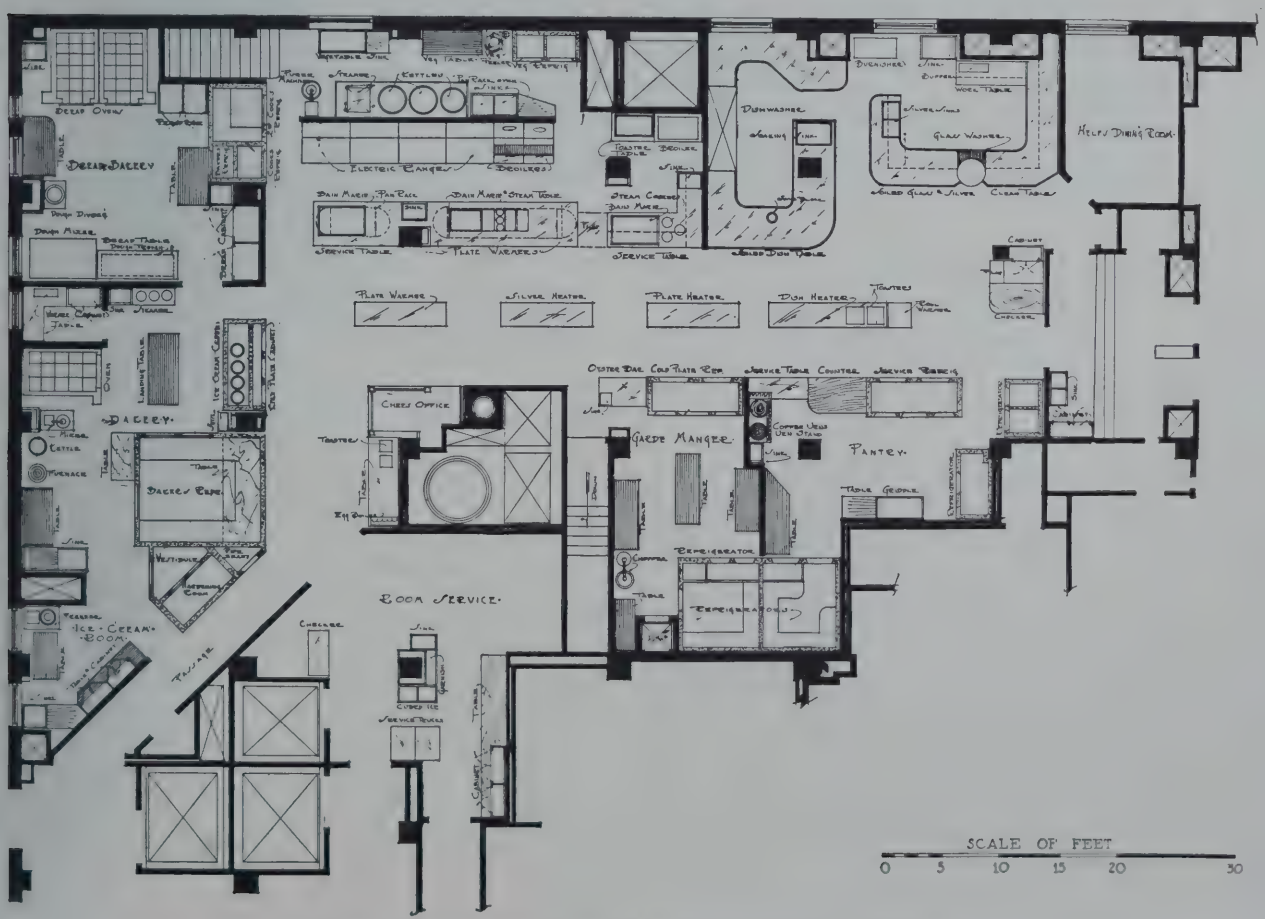
Kitchen in The Coronado Hotel
St. Louis

Ventilation a Feature of the Kitchen
Wade Park Manor, Cleveland

planning depends upon the shape of the kitchen area. The room should be as nearly square as possible, laid out in hollow square formation, opening into a dining room on the same floor if possible, with adequate supply entrances at the opposite end. In every instance right-hand service should be secured. With a little consideration the disagreeable and unsightly portions of the work, such as pot washing, vegetable preparation and vegetable steaming, may be hidden by a partition extending possibly 7 feet above the floor and placed back of ranges and counters. The general tendency is to have all dish heaters and counter fronts, which are first seen as a visitor enters a kitchen from the dining room, very attractively finished. This does not add a prohibitive sum to the entire cost of equipment, and it creates an impression of sanitary service that is invaluable. Either planished iron with nickel plated frames or polished steel trim and white porcelain held in nickel silver frames are extensively used and are most practical for this purpose.

Coffee Shop Equipment; The Belden-Stratford Hotel, Chicago

Where gas is available, gas ranges are selected for the heavy cooking. Coal is dirty and dusty, causes a great deal of labor, and requires space for storage. Oil is also dirty, and unless carefully watched creates such intense heat that it will melt and burn out the heaviest range or oven. Electricity is considered where a power rate of approximately 2 cents a kilowatt may be obtained. There is a constantly increasing number of power companies



Kitchen Arrangement; The Belden-Stratford Hotel, Chicago

catering to this heavy duty patronage, and electric kitchens are increasingly in demand. The work of the ranges is supplemented by stock kettles and steamers, either placed at their sides or, as already suggested, back of a partition behind the ranges. Steam for kitchens is essential, and if it is not available at the necessary pressure of from 25 to 35 pounds, gas-heated boilers producing live steam should be provided. There are on the market many makes of these boilers which are well adapted to kitchen requirements. As a general rule a 10 h.p. boiler will furnish all steam requirements for the kitchen of a dining room seating 200. It requires but little space and is very easily operated.

Service heaters for silver and plates are provided in front of the cooks' tables as well as in the center of the room. The central fixtures should be low enough to act as tray stands for the waiters, and their tops should not be heated. The tops of these fixtures should be of metal which will not corrode by contact with vegetable acids or impart a taste to either liquid or solid foods. The doors on dish heaters, instead of extending their full height, should be provided for each separate shelf or compartment and may be either made sliding, rolling on casters, or of the lift type which raise back and over the shelf. These smaller doors are much easier to handle, do not waste the heat, and last a great deal longer than the large, heavy construction of former years.

Service counters for pastry, pantry goods and cold meats occupy the remaining space of the hollow square formation. Wooden counters, though still to be found, are mostly discarded in favor of the all-metal construction, save for the working tops which are of built-up sectional maple, tongued, glued and rodded together. The fronts and ends are made to match the heaters. Cold plate refrigerators replace the service heaters and are made to exactly duplicate them in appearance. Refrigerators, ice cream cabinets and fish boxes, together with sinks and tables, occupy the space back of counters and are arranged to conveniently carry and handle all kinds of ready-to-serve foods.

No kitchen of any size now uses ice for refrigeration. Either ammonia or carbonic acid gas machines for producing artificial refrigeration with brine circulating systems are now as standard a part of kitchen equipment as the range itself. This universal use of coil cooling systems has also made for much better refrigerator construction. The very best of lumber, heavy brass hardware, sheet cork-board insulation and good workmanship are invariably specified on all work. The larger refrigerators are built up on the ground of cork and cement. This construction creates the result that ice boxes after years of use, instead of being the most unsightly and dirty fixtures, now stand up as well as the rest of the equipment and save materially in the expense of refrigeration, a result desirable indeed.

Power machinery is found to be a paying investment, and in addition to the dishwasher and peeler, which have long been used, the meat chopper, meat slicer, bread slicer, coffee mill, mayonnaise mixer, mixing machines, potato mashers, etc., are just as common and practical. For pantry work many electrical devices have been recently added, such as automatic electric toasters, electric waffle irons, automatic electric egg boilers, and other pieces of equipment which expedite service and improve its quality.

The dishwashing pantry is the most used and may be, at the same time, the most unsightly department of the kitchen. With modern machines, however, a great deal of the drudgery is done away with, and either a conveyor or basket machine, provided with overhead sprays and a washing bed built on a level with the soiled and clean dish tables, will rapidly handle a large number of dishes. The breakage of dishes is practically eliminated in such a type of machine, but in order to protect the glazed surfaces of the china, the tables, which should always be built of metal, should be covered on the bottom with battleship linoleum or fiber. The fronts of these tables may be screened with white porcelain panels and be made to effectually conceal garbage cans, dish racks and other unsightly necessities of this department. In the larger hotels a silver burnishing and cleaning machine must be located near the dish pantries to complete the operation of cleaning the silver after it has gone through the dishwashing machine.

In order to have the proper framework for the equipment such as is here described, the room in which it is placed must be naturally lighted, with a skylight where possible, and thoroughly ventilated with a suitable hood over every fixture which either creates heat or gives off steam. Floors may be of red tile set in black mortar, and all walls be of 6-inch square white or light yellow tile or of equally efficient sanitary and attractive materials.

No kitchen would be complete without arrangement for room service which, except in the very largest hotels, consists of a desk where orders are received by telephone and an adjacent rack for room service tables which are taken away one at a time and made ready to receive the orders which, when prepared, are delivered by the waiter to the room, being carried through on special room service elevators. In order to keep an accurate check on the silver and dishes used for room service, separate dish heaters should be provided near this station.

Room service trucks which have both heated and cold compartments and a top which folds over and when open acts as a table, are being tried out. At present they are not entirely satisfactory, since anything on wheels which has to contend with the kitchen floor, elevators, and carpets is not a great success.

KENSINGTON FURNITURE

AWARDED GOLD MEDAL OF HONOR IN NATIVE INDUSTRIAL ART
39TH ANNUAL EXHIBITION ARCHITECTURAL LEAGUE OF NEW YORK
FEBRUARY 1, 1924

SIDEBOARD AND PEDESTALS — *after the Georgian*
Mahogany, Carved and Inlaid with Tulipwood, Satinwood and Ebony

THE group of dining room furniture including the sideboard illustrated formed our principal exhibit in the recent Architectural League Exhibition.

In every detail of design and execution it represents the highest expression of present day craftsmanship and may be compared only with the work of the 18th Century English masters when the art of cabinet-making reached its apogee.

The table, with three pedestals and seating capacity up to sixteen, is an unique and charming design, while in place of the conventional side-table is a broken-serpentine commode that rivals the other pieces in decorative quality. In each piece are perfectly reflected the dignity and quiet elegance of the Georgian style that make it pre-eminently the choice for the important dining room.

The same sincerity in design and equal quality in craftsmanship characterize all Kensington Furniture; and Kensington Furniture is made in all the decorative styles appropriate for American homes.

Architects interested in completing the interiors they design with furnishings harmonious in both character and quality are cordially invited to avail themselves of the service of the Kensington Showrooms and staff.

Illustrated Booklet F sent on request

KENSINGTON MFG. COMPANY
MANUFACTURERS AND IMPORTERS
DECORATIVE FURNITURE ~ ART OBJECTS
NEW YORK
NEW SHOWROOMS, 41 WEST 45th STREET, 6th FLOOR

MANTEL-PIECES

TODHUNTER

FIREPLACE EQUIPMENT

THIS CHIMNEY CORNER, with its original oak panelling, was removed from an OLD INN at Wokingham, England.

It is now on exhibition in the window of our galleries at 414 MADISON AVENUE NEW YORK

Sizes and particulars will be sent upon request

Memorial Pulpit, Grace Cathedral, Topeka, Kansas
A Product of our Wood Carving Studios

Church Furniture

ALTARS · PULPITS · LECTERNS
BAPTISMAL FONTS
CHOIR STALLS · PRIE-DIEUX
ALTAR RAILINGS
ORGAN SCREENS · ROOD BEAMS
READING DESKS
MEMORIALS IN CARVED WOOD
PEWS · CHAIRS

American Seating Company

General Offices
1094 Lytton Building
CHICAGO

NEW YORK
620—119 W. 40th St.

BOSTON
79 Canal Street

SERVICE SECTION
of THE ARCHITECTURAL FORUM

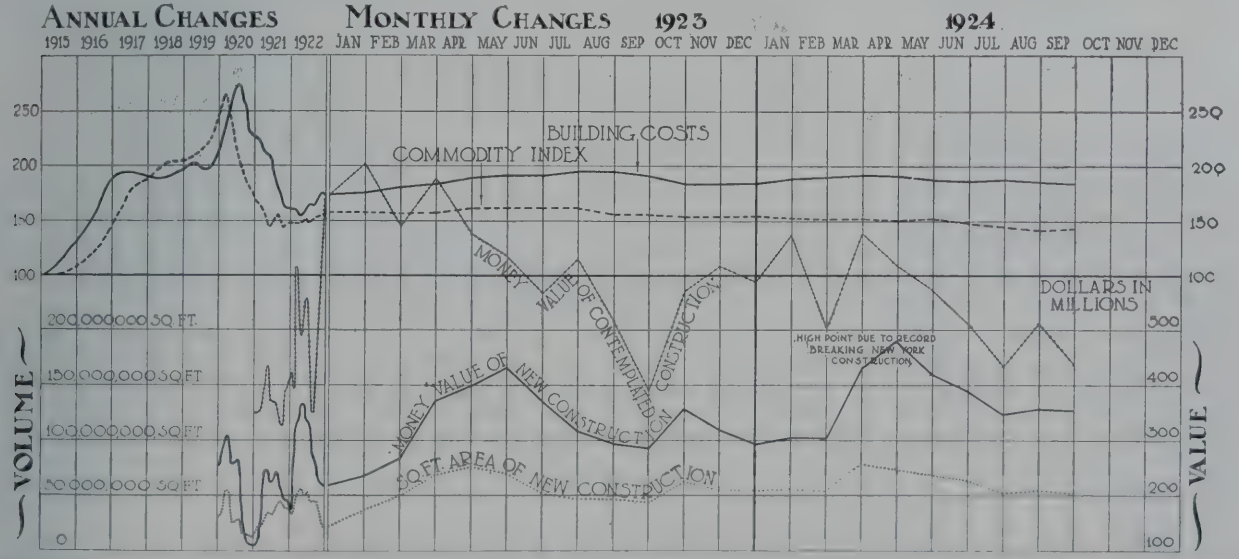
Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

The Building Situation

THE records for September, which completes the first nine months of activity in 1924, indicate that this year has already passed the four billion dollar mark and that the total value of construction for the year will be over five billion dollars, as forecast in the January, 1924 issue of THE ARCHITECTURAL FORUM. Figures of the F. W. Dodge Corporation, which cover a large proportion of the country, show a total value of contracts awarded since January 1 of $3,365,077,700, an increase of nearly 12 per cent over the figures for the corresponding nine months of 1923. The total of contracts let in September is 19 per cent higher than in the previous September. In examining the line "Money Value of New Construction," in the chart below, it will be seen that the decrease in totals of contracts in June, July, August and September was not as great in 1924 as in 1923, and it is expected that October and November will show higher totals than the previous months.

There has been a slight, steady decrease in the cost of building materials and in the cost of building, as indicated in the building cost line in this chart. It is anticipated that there will be a heavy volume of winter construction, which will help stabilize demand and relieve the pressure when the active spring season begins to develop its usual heavy volume. The subject of winter building is now being studied more carefully than ever before.

The prospects for new building are good, the total value of construction for which plans were filed in September being nearly $40,000,000 higher than in September, 1923. Architects are beginning to feel effects of an active revival of business in their offices, and each month is now showing an interesting quota of delayed projects being brought out for active consideration. It is to be noted that the general character of new buildings for which plans are being filed is better than for some time, and that much of the highly speculative residential construction is being replaced by better types of investment building. The outstanding construction activity is to be found in the Middle Atlantic States, where building is much more active than in other sections, but general reports promise increased activity soon in the West and on the Pacific Coast.



THESE various important factors of change in the building situation are recorded in the chart given here: (1) *Building Costs.* This includes the cost of labor and materials; the index point is a composite of all available reports in basic materials and labor costs under national averages. (2) *Commodity Index.* Index figure determined by the United States Department of Labor. (3) *Money Value of Contemplated Construction.* Value of building for which plans have been filed based on reports of the United States Chamber of Commerce, F. W. Dodge Corp., and *Engineering News-Record.* (4) *Money Value of New Construction.* Total valuation of all contracts actually let. The dollar scale is at the right of the chart in millions. (5) *Square Foot Area of New Construction.* The measured volume of new buildings. The square foot measure is at the left of the chart. The variation of distances between the value and volume lines represents a square foot cost which is determined first, by the trend of building costs, and second, by the quality of construction.

JOHNSON

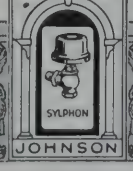
Winter knows no ills or chills where The Johnson Pneumatic System of Temperature Regulation governs the temperature in the home. Each room is maintained at the correct and even degree, as required by the room's purpose and occupancy. The Johnson Thermostat turns on and off each radiator independently of the others in the house: and does so reliably, as the mercury in the wall thermometer goes beyond or below the point stipulated. The health of the household is guarded the white joys of Winter ne'er turn to black sorrow.

The foregoing applies with equal emphasis to the office building or business block about to be erected, in course of construction or already built.

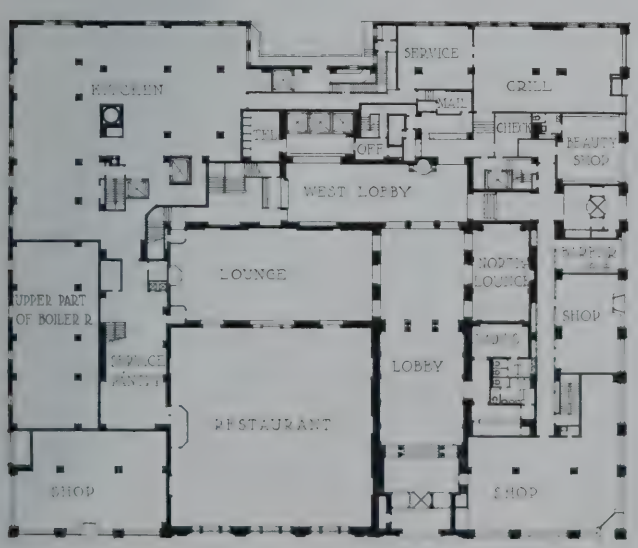
JOHNSON SERVICE COMPANY, MILWAUKEE

AUTOMATIC TEMPERATURE REGULATION FOR 38 YEARS

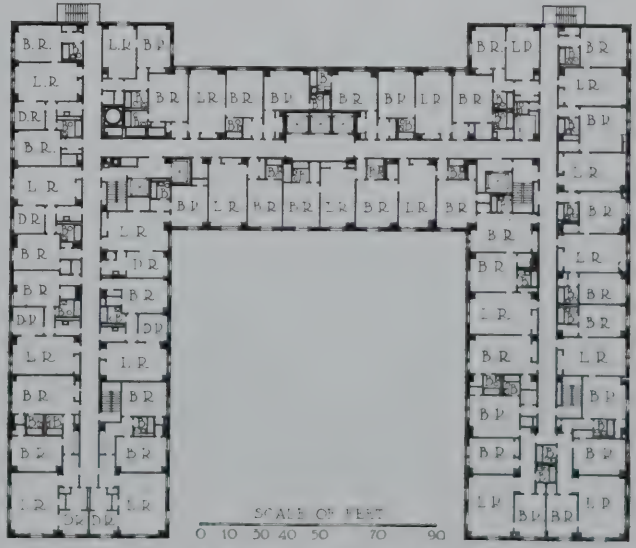
TWENTY-EIGHT BRANCHES UNITED STATES AND CANADA



NUMBER of apartments approximately 250; 693 rooms altogether. Hotel management permits tenants to prepare meals in rooms or will serve meals in the apartments when desired. Each apartment has a small kitchenette or pantry containing sink, ice box, gas range, china closet, dishwasher, linen, dishes, silver, pots and pans. Maid service furnished as desired; 32 maids' rooms in the hotel. Dining room can seat about one-half of the tenants at one time. Work begun June, 1923, completed March, 1924, at a cost, for construction only, of 80 cents per cubic foot.



GROUND FLOOR PLAN



TYPICAL FLOOR PLAN

THE BELMONT HOTEL, CHICAGO

FUGARD & KNAPP, ARCHITECTS; WARREN & WETMORE, CONSULTING ARCHITECTS

THE DIRECTOIRE DINING ROOM

Photos. Trowbridge

THE MAIN LOBBY

THE BELMONT HOTEL, CHICAGO

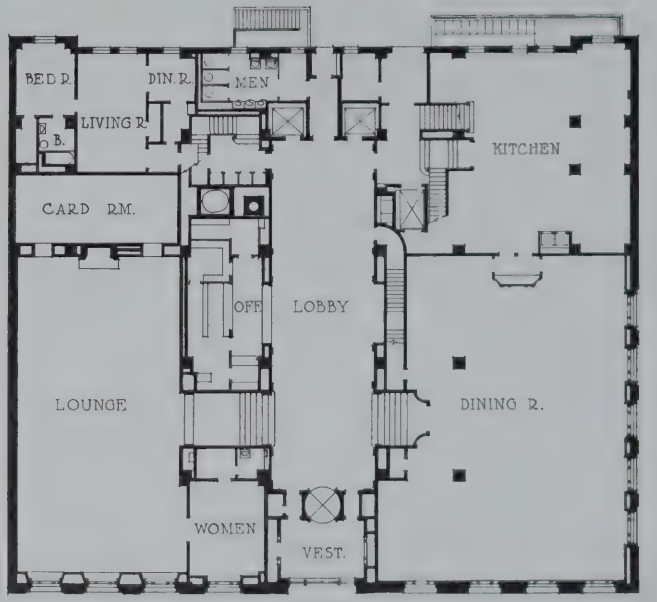
FUGARD & KNAPP, ARCHITECTS; WARREN & WETMORE, CONSULTING ARCHITECTS

GENERAL EXTERIOR VIEW

NUMBER of apartments 180, varying in size from three to eight rooms; 420 rooms altogether. Tenants are permitted to prepare meals themselves or hotel management will serve meals in apartments when desired. The kitchenette or pantry closet contains sink, ice box, gas stove, china closet, silver, dishes, pots and pans, etc. Maid service for all apartments furnished if desired. Rooms on the roof for approximately 12 maids, all other servants sleeping outside. Dining room seats 120, or a little less than one-half the tenants, who number approximately 300. Work was begun July, 1922, and completed May, 1923, at a cost for construction only of 80c per cu. ft.

Construction: steel frame, concrete floors. Interior partitions: clay tile, soundproofed between apartments. Floors: cement trowel finish, carpeted. Windows: wood frame and sash. Heating: high pressure plant, vapor system. Refrigeration provided.

TYPICAL FLOOR PLAN



GROUND FLOOR PLAN

THE LAKE SHORE DRIVE HOTEL, CHICAGO

FUGARD & KNAPP, ARCHITECTS

THE MAIN DINING ROOM

Photos. Trowbridge

WEST WALL OF THE LOBBY

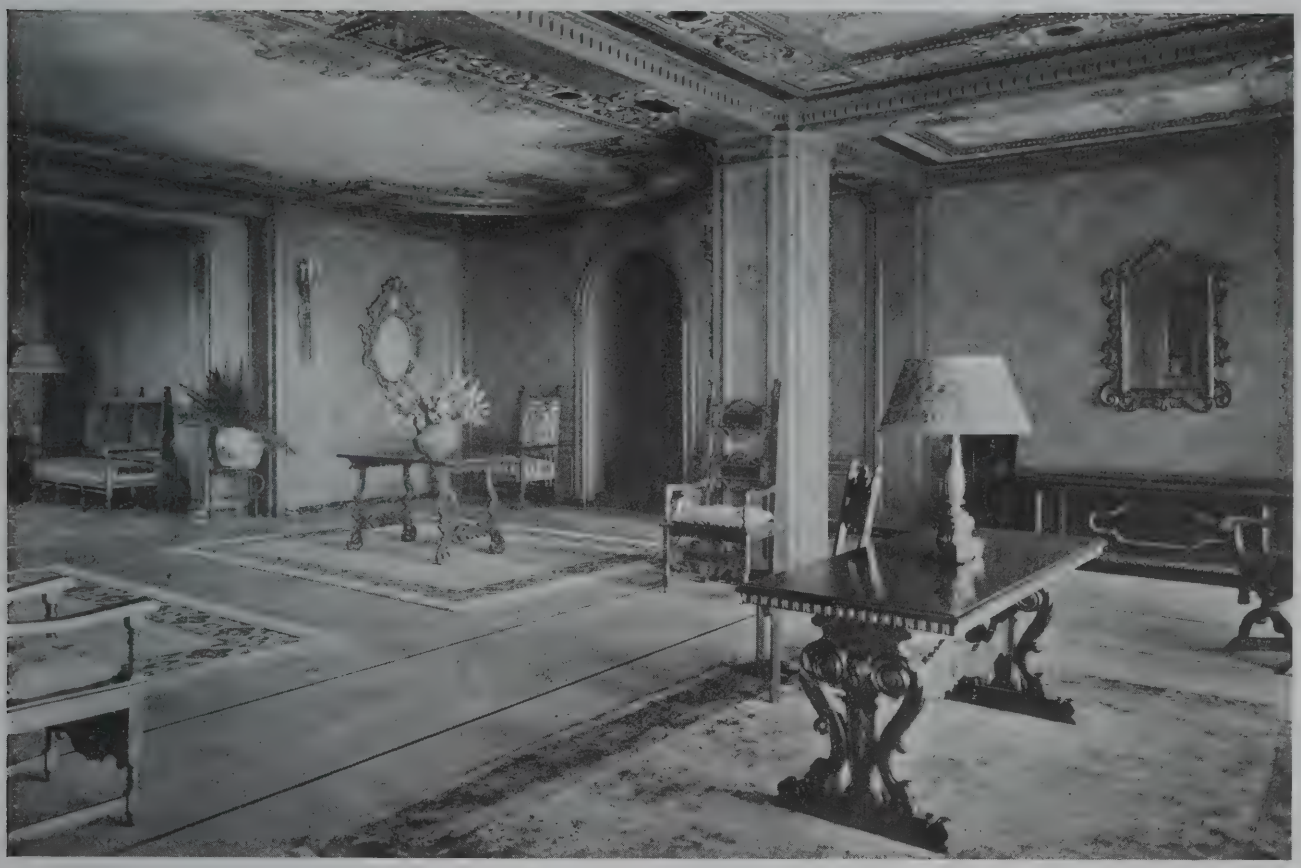
THE LAKE SHORE DRIVE HOTEL, CHICAGO

FUGARD & KNAPP, ARCHITECTS

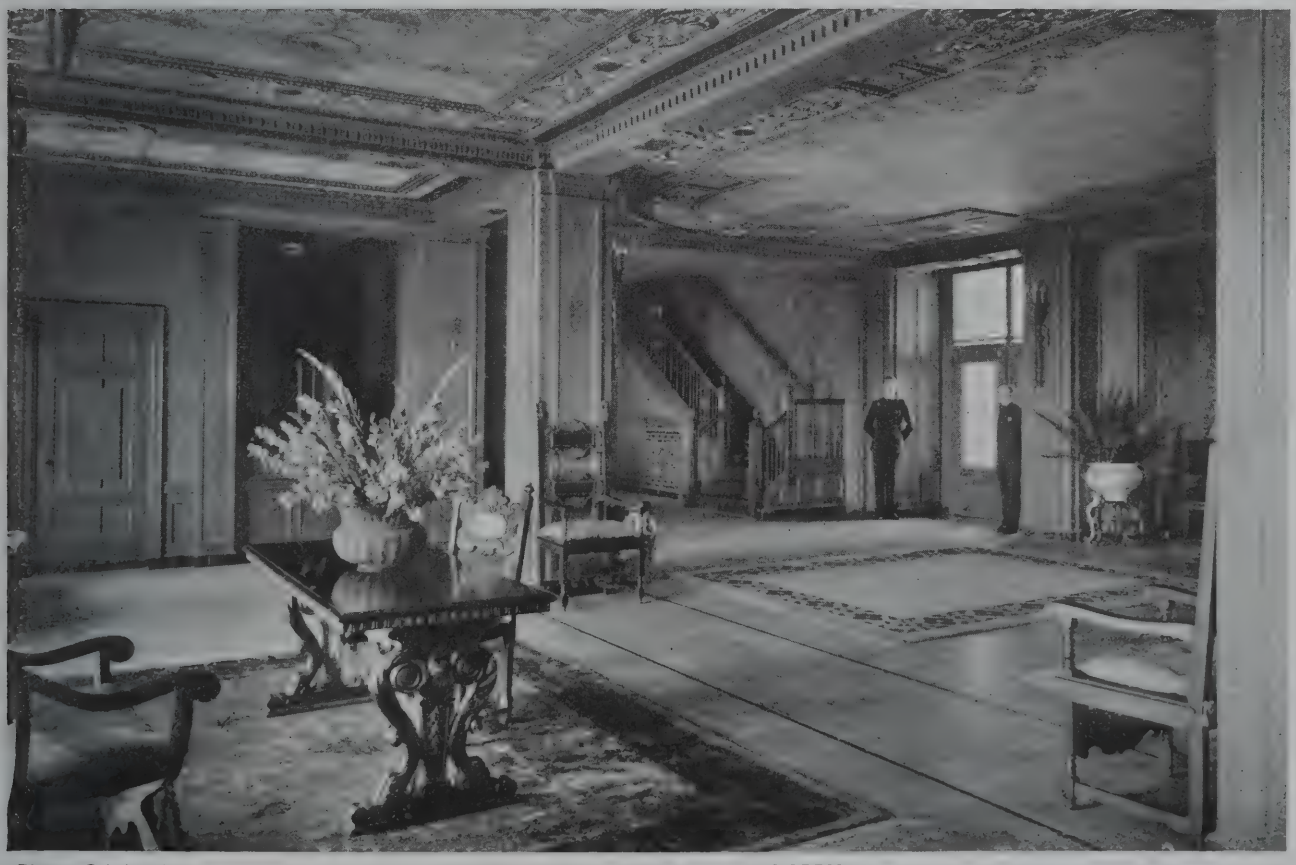
NUMBER of the apartments 140, varying in size from one to six rooms, according to demand. Tenants are permitted to prepare meals in apartments or meals will be served by management in apartments when so desired. Kitchenettes equipped with electric ranges, sinks, cupboards, refrigerators and incinerators. Maids furnished by the management as a special service, paid for by the hour. No general dining room in this house. A few rooms for maids are located in basement. Construction: steel framing, concrete floors, brick exterior walls. Interior partitions: hollow tile and solid plaster. Floor construction and finish: concrete reinforced and finished with cement top covered with carpet. Tile floors in all bathrooms, and marble in lobby. Work begun in May, 1923, at a cost per cubic foot of 65 cents or $7.50 per square foot, including floor and roof. Entrance lobby has stucco walls painted and decorated, wood trim, travertine floors.

FIRST FLOOR PLAN TYPICAL FLOOR PLAN

HUNTINGTON APARTMENTS, SAN FRANCISCO
WEEKS & DAY, ARCHITECTS



VIEW TOWARD ALCOVE IN LOBBY



Photos. Gabriel Moulin

VIEW TOWARD ENTRANCE IN LOBBY

HUNTINGTON APARTMENTS, SAN FRANCISCO

WEEKS & DAY, ARCHITECTS

NUMBER of apartments 175, varying from one to six rooms to each apartment; 88 apartments have kitchenettes for use of tenants. Management will serve meals in apartments at a service charge of 25 cents per person. Kitchenettes are equipped with gas ranges, iceless refrigerators, sinks, china closets, silver, linen, glass, china, electric percolators, cooking utensils and garbage removal service. Maid service provided by management for all tenants. Main dining room seats 250, private dining room 50. Work begun March, 1922, completed November, 1923; cost of 70 cents per cubic foot for building.

FIRST FLOOR PLAN

TYPICAL FLOOR PLAN

ALCAZAR HOTEL, CLEVELAND

H. T. JEFFERY & SON, ARCHITECTS

VIEW FROM THE FOUNTAIN TOWARD THE ARCADE

Photos. Tebbs & Knell, Inc.

VIEW TOWARD ENTRANCE TO LOBBY FROM THE GARDEN

ALCAZAR HOTEL, CLEVELAND

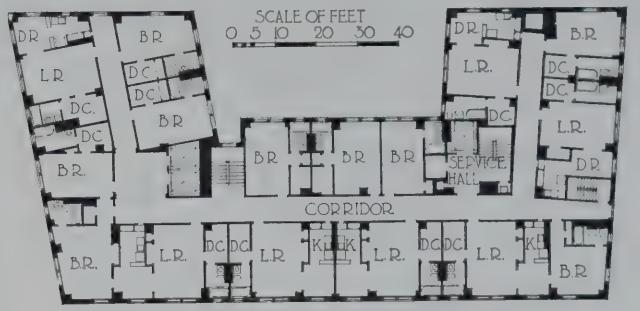
H. T. JEFFERY & SON, ARCHITECTS

GENERAL EXTERIOR VIEW

THE MELBOURNE HOTEL, ST. LOUIS

PRESTON J. BRADSHAW, ARCHITECT

NUMBER of apartments 169, divided in this way: 78 one-room apartments; 65 four-room; 15 five-room; 13 six-room. Tenants are permitted to prepare meals in their apartments, or the management will serve meals if desired. Kitchenettes are equipped with combination refrigerators, garbage disposal, receiving compartments, storage closets, gas ranges and sinks. Dining room and roof garden furnish ample seating capacity for all tenants. No maids sleep in the house. Construction, reinforced concrete. Interior partitions, hollow tile. Floor construction and finish, monolithic cement. Heating, vapor steam. Work was begun in January, 1921, and was done by separate or sub-contract method under the direction of the architect.



TYPICAL FLOOR PLAN

FIRST FLOOR PLAN

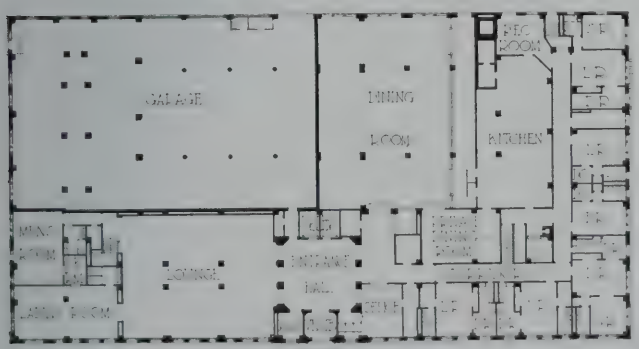
THE TUDOR DINING ROOM

VIEW FROM THE LOBBY TOWARD THE LOUNGE

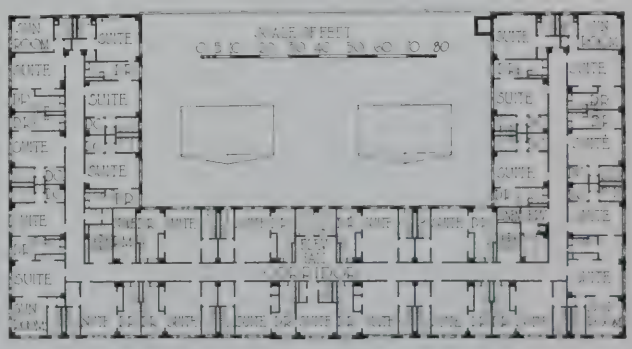
THE MELBOURNE HOTEL, ST. LOUIS

PRESTON J. BRADSHAW, ARCHITECT

NUMBER of apartments 167, divided in this way: 200 single rooms; 101 four-room apartments; 44 five-room apartments. Tenants are permitted to prepare meals themselves, or the management will serve meals in apartments if desired. Kitchenettes are equipped with combination refrigerators, garbage disposal, receiving compartments and kitchen storage, gas ranges and sinks. Maid service furnished by management at nominal charge. The dining room is of ample size to accommodate guests from outside as well as such tenants as desire to use it. No servants sleep in the house. Work begun August, 1922, and carried out by separate or sub-contract method under direction of architect.



GROUND FLOOR PLAN



TYPICAL FLOOR PLAN

BELLERIVE APARTMENT HOTEL, KANSAS CITY

PRESTON J. BRADSHAW, ARCHITECT

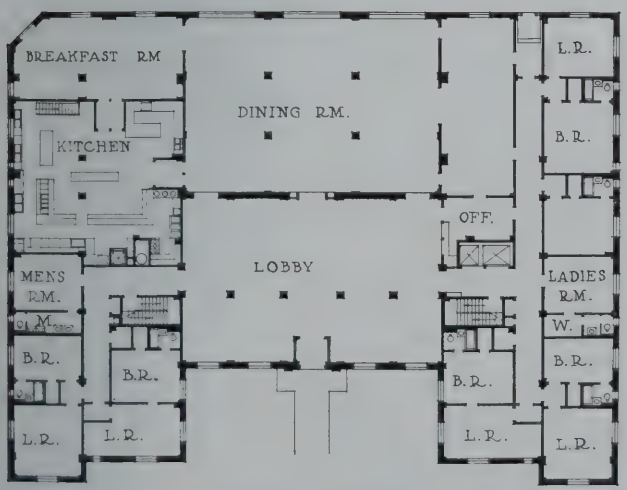
THE DINING ROOM

VIEW FROM ENTRANCE HALL TOWARD LOUNGE

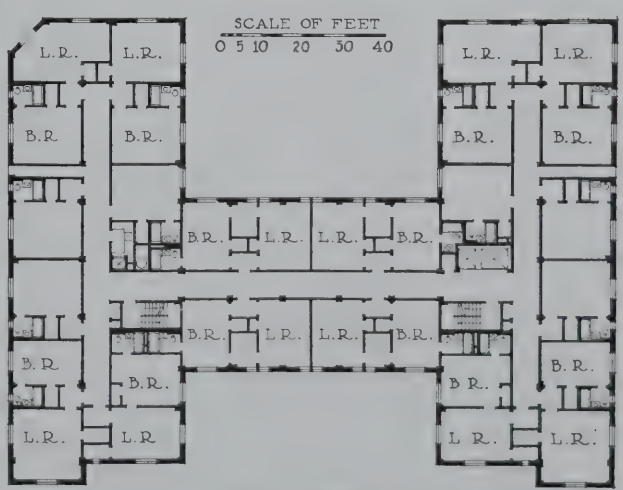
BELLERIVE APARTMENT HOTEL, KANSAS CITY

PRESTON J. BRADSHAW, ARCHITECT

VIEW FROM BAY STATE ROAD OF THE ENTRANCE FRONT



GROUND FLOOR PLAN



TYPICAL FLOOR PLAN

THE SHERATON, BOSTON

STRICKLAND, BLODGET & LAW, ARCHITECTS

Photos. Paul J. Weber

DETAIL OF THE MAIN ENTRANCE

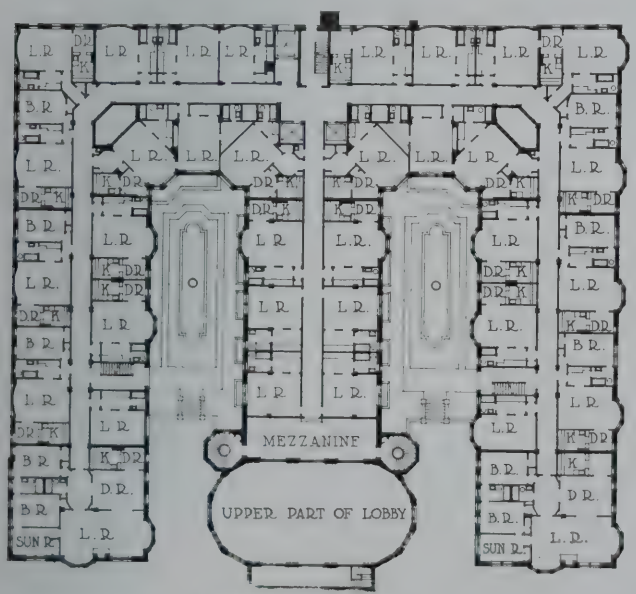
DOORS BETWEEN LOBBY AND DINING ROOM

THE SHERATON, BOSTON

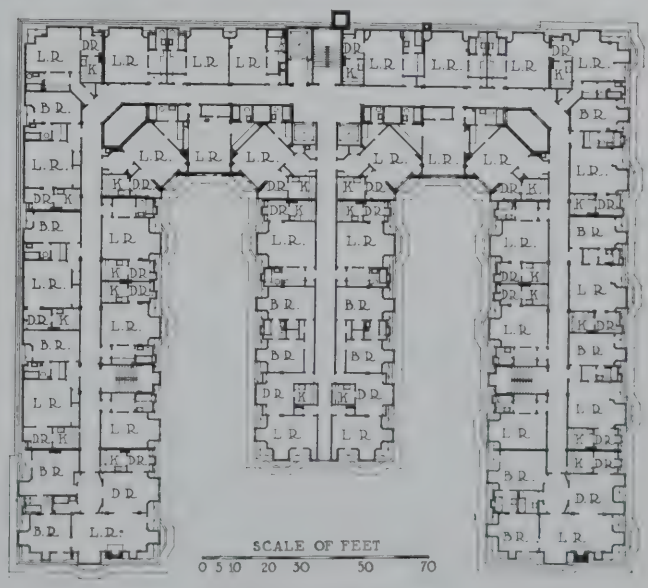
STRICKLAND, BLODGET & LAW, ARCHITECTS

VIEW OF THE PARK LANE VILLA FROM EAST 105TH STREET

NUMBER of apartments 193, varying in size from one room to six or seven. Almost all apartments contain kitchenettes and dining alcoves. Kitchenettes contain gas stoves, sinks, cupboards and iceless refrigerators. No accommodation for permanent residence of servants. Dining room seats from 250 to 300 guests. Work begun June, 1922, at a cost per cubic foot of 75 cents.



FIRST FLOOR PLAN



TYPICAL FLOOR PLAN

THE PARK LANE VILLA, CLEVELAND

REYNOLD H. HINSDALE, ARCHITECT

Photos. Tebbs & Knell, Inc.

THE MAIN ENTRANCE AND LOUNGE AT STREET LEVEL

THE PARK LANE FACADE OF THE VILLA

THE PARK LANE VILLA, CLEVELAND

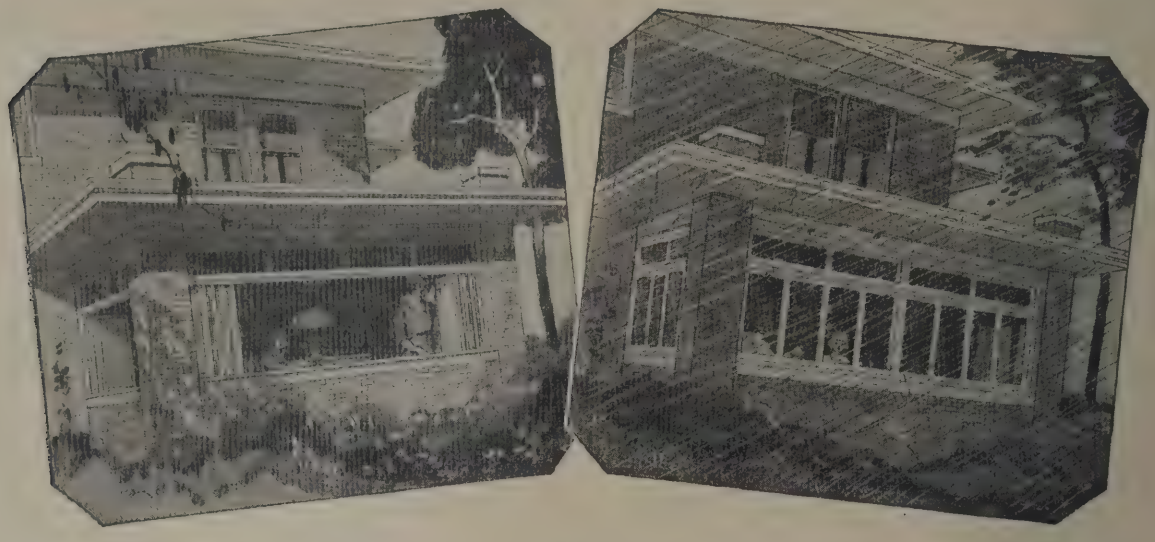
REYNOLD H. HINSDALE, ARCHITECT

THE ARCHITECTURAL FORUM

DECEMBER

1924

QVALITY LEAVES ITS IMPRINT



AiR-Way Lets the Outdoors In —or Keeps the Outdoors Out

AIRWAY

Multifold Window Hardware

Don't think of planning another dwelling without first investigating the many advantages of AiR-Way hardware. Write today for your copy of Catalog F-4, which tells all about it. Most hardware and lumber dealers carry AiR-Way hardware.

When the weather is warm and pleasant, sun rooms, sleeping porches and other rooms equipped with *AiR-Way Multifold Window Hardware* may instantly be thrown open to the benefits of sunshine and fresh air.

And when winter comes, or sudden summer rains descend, these same rooms are quickly and securely sealed against the weather. The owner of a porch installation writes: "Now, when it rains, we have an enclosed room. And on pleasant days we have an open porch. While in winter we have a room which is easily kept warm."

That's the notable advantage of *AiR-Way*. It either lets the outdoors in—or keeps the outdoors out. When open, *AiR-Way* provides an opening the full width and depth of the window frame. When closed, it is absolutely weather-tight and rattle-proof. And it operates without interference from either screens or drapes.

AiR-Way is by far the most perfect enclosure for sun rooms and sleeping porches. It also is ideal for bed rooms, living rooms, dining rooms and kitchens. Old-fashioned double-hung windows may easily be replaced with *AiR-Way*.

Exclusive manufacturers of "Slidetite"—the original sliding-folding garage door hardware

New York
Boston
Philadelphia
Cleveland
Cincinnati
Indianapolis
St. Louis

Richards-Wilcox Mfg. Co.

"A Hanger for any Door that Slides."

AURORA, ILLINOIS, U.S.A.

RICHARDS-WILCOX CANADIAN CO., LTD.
Winnipeg LONDON, ONT. Montreal

Chicago
Minneapolis
Omaha
Kansas City
Los Angeles
San Francisco
Seattle

(218)

THE ARCHITECTURAL FORUM

VOLUME XLI NUMBER 6

CONTENTS for DECEMBER 1924

PLATE ILLUSTRATIONS	Architect	Plate
THE ROOSEVELT HOTEL, NEW YORK	*George B. Post & Sons*	73-76
CHAMBER OF COMMERCE BUILDING, NEWARK	*Guilbert & Betelle*	77, 78
HOUSE OF DR. HAROLD L. SPRINGER, ROCKLAND, DEL.	*Brown & Whiteside*	79, 80
THE FORUM STUDIES OF EUROPEAN PRECEDENTS (Plates 9-16)		

LETTERPRESS	Author	Page
COVER DESIGN: DETAIL FROM INDEPENDENCE HALL	*From a Drawing by Louis C. Rosenberg*	
THE EDITOR'S FORUM		41
EXTERIOR OF ROOSEVELT HOTEL, NEW YORK	*From an Etching by Ralph Shepard*	Frontispiece
THE NEW ARROWHEAD INN	Matlack Price; Dwight James Baum, Architect	269
THE ROOSEVELT HOTEL, NEW YORK	George B. Post & Sons, Architects	277
HOUSE OF J. G. KELLOGG, ESQ., WINNETKA, ILL.	Chatten & Hammond, Architects	285
"LITTLE ORCHARD," GREENWICH, CONN.	Phelps Barnum, Architect	289
A RENAISSANCE GARDEN AT SAN DOMENICO, FLORENCE	*Roger Wearne Ramsdell and Harold Donaldson Eberlein*	293
THE DESIGN OF A TRUSS WITH PARALLEL CHORDS	*Charles L. Shedd, C.E.*	301
INTERIOR DETAILS FROM HOTEL GOUTHIERE, PARIS		307
PLATE DESCRIPTION		311
EDITORIAL COMMENT		312

Opening of American Wing at Metropolitan Museum

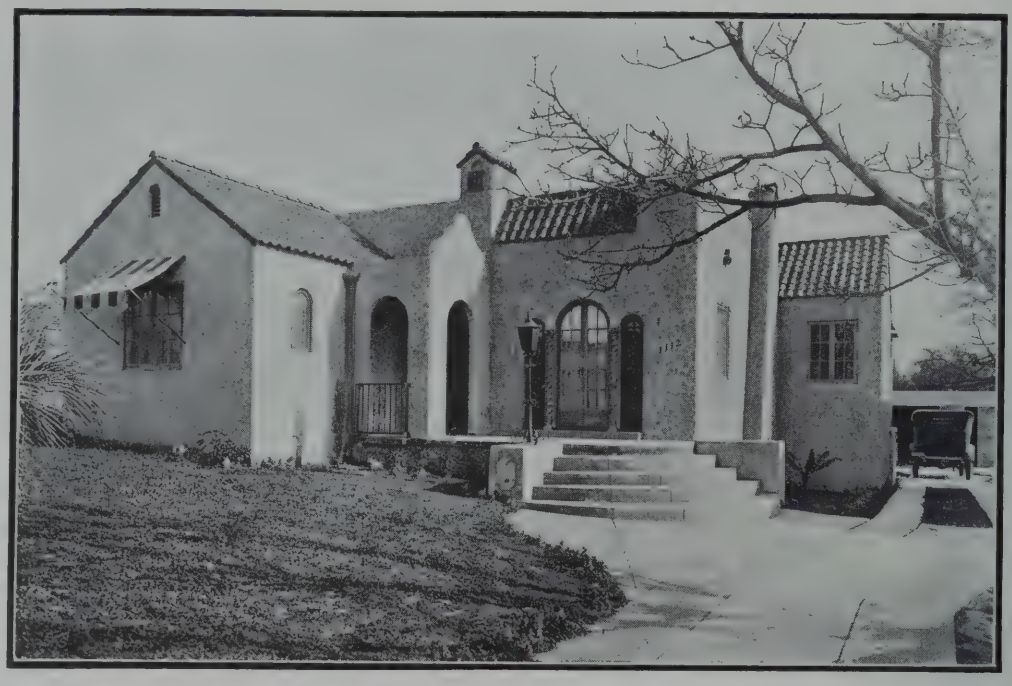
PARKER MORSE HOOPER, Editor

Published Monthly by
ROGERS AND MANSON COMPANY
383 Madison Avenue, New York

Yearly Subscription, payable in advance, U.S.A., Insular Possessions and Cuba, $6.00
Canada.....$6.75 Foreign Countries in the Postal Union, 7.50
Single Copies.....60 cents All Copies Mailed Flat

Trade Supplied by American News Company. Entered as Second Class Matter at the Post Office, New York, N. Y., under the Act of March 3, 1879.
Copyright, 1924, by Rogers and Manson Company

Howard Myers, *President*
C. Stanley Taylor, *Vice-president*
James A. Rice, *Vice-president*
Robert Sweet, *Secretary and Treasurer*



Residence of E. S. Brooks, 1112 Hacienda St., Los Angeles, Cal. Bishopric Stucco over Bishopric Base on all exteriors

Plasticity and Permanency

Like clay in the hands of the expert modeler, like a precious metal wrought by a skilled smith, so does stucco, because of its plasticity lend itself to the will of the architect. Shadow and sunlight, richness and variety of texture, each contributes to the feeling of a wall done in stucco. Plasticity provides for the introduction of the third dimension so lacking in flat walls of brick, stone and frame.

In utilizing stucco, however, the important points to be considered are the strength and durability which accompany the factor of plasticity. Finely ground to obtain flexibility, will the stucco set up hard and dense? Is it waterproof, thus doing away with dampness and erosion? These are points on which the architect must satisfy himself when specifying.

Every day, more and more, are architects finding that Bishopric Stucco meets each and every one of the above requirements, because Bishopric is built to a standard from only the finest of raw materials the domestic and foreign markets afford.

Bishopric Is Sold by Dealers Everywhere

The BISHOPRIC MANUFACTURING Co.
103 ESTE AVE., CINCINNATI, OHIO.
NEW YORK CITY CINCINNATI OTTAWA, CANADA

The BISHOPRIC MFG. CO. OF CALIFORNIA
LOS ANGELES

BISHOPRIC

Stucco Over Bishopric Base

"A Complete Wall Unit for all Time and Clime"

ROOSEVELT HOTEL, NEW YORK

FROM AN ETCHING BY RALPH SHEPARD

The Architectural Forum

BOOK DEPARTMENT

A Work on the Development of Wall Paper

Reviewed by CARROLL BILL

HISTORIC WALL PAPERS; From Their Inception to the Introduction of Machinery. By Nancy McClelland, with an introduction by Henri Clouzot, Conservateur, du Musee Galliera, Paris. 458 pp., 8 x 11 ins; 12 plates in color, 245 illustrations in halftone, and chart of periods. Limited edition. Price $25. J. B. Lippincott Co., Philadelphia.

ONE hardly associates romance and human interest with such prosaic stuff as wallpaper, but Nancy McClelland has written a most fascinating story of its origin, growth and development. It is rather surprising that, familiar as we are with wallpaper as a necessary item of our modern domestic life, so little is known or has been written to tell us just how and why it came into being and how it progressed from its early stages of hand-painted crudity to the high degree of technical and artistic excellence of those fine scenic papers of the early nineteenth century now so eagerly sought by collectors and decorators. Not that the subject has been entirely neglected, but as much of the matter available in books is so utterly conjectural, we lack confidence in its basic facts, and Miss McClelland tells us in her first chapter that there has never been a serious attempt to study the subject from original sources, and that the chief reason for the lack of a scholarly treatment of the matter was that there were no readily accessible sources of authentic information. We admire the author's painstaking energy in unearthing from the most remote places material bearing on the subject, and her quest led through French governmental legislative archives, into private houses, attics and cellars, and through ancient English, French and German literature, occupying a period of three years' constant pursuit of the subject in hand.

An Eighteenth Century Scenic Wallpaper
Illustration from "Historic Wall Papers"

The period covered by this history is, roughly speaking, from 1500 to 1840, after which date enough is known of the wallpaper industry to make further research unnecessary; from the time of the mid-nineteenth century the increasing efficiency of machine printing put a gradual end to any notable production of hand-blocked papers. The author found that the history of the development of wallpaper could be divided into periods, that each period had a real relation to those preceding and following, and that the definite purpose for the creation of wallpaper was to produce inexpensive effects of color and texture in imitation of and in substitution for costly woven fabrics and painted decoration.

The first period has largely to do with the story of the *dominotiers,* a group of Frenchmen whose amusing early efforts in making designs of little grotesques, geometrical patterns and marbleizing, made possible the later developments of decorated paper for wall hangings. Following them in what may be called a second period came the making of paper intended to imitate tapestries and costly fabrics, hitherto only to be possessed by the wealthy. The designs were laid on paper with a specially prepared varnish and chopped wool of various colors blown or dusted on so as to adhere, forming a raised pile of a luxurious texture at a comparatively low cost. Then follows a period in which there was developed paper printed to imitate figured fabrics, linen or cotton; and now the attempt, hitherto untried, was made to so arrange designs that by placing them side by side a "repeat" of pattern was obtained, and Jean Papillon, the originator of this idea, must be credited with the invention of wallpaper as we know it today. This same Papillon furnishes us with another amusing phase of the industry in that he carried out personally all steps from the first making of the designs, engraving, painting, and coloring them, selling the finished products, and then to give full value, putting the paper in place on the walls,—truly a one-man affair, quite inconceivable in this day of labor specialists when each detail belongs to some one workman.

One of the most interesting chapters of the history is that telling of Chinese painted paper. It was customary at the conclusion of important business between great Chinese merchants and their European clients to present gifts, usually in the form of painted paper panels with designs of bamboos and landscapes, the wily Chinese keeping for their own use the more desirable panels of silk, painted with birds, flowers and figures. So it was that returning sea captains brought back these delightful and novel gifts, resulting in the sending back to China orders for more. The demand so far exceeded the supply that these Chinese papers were copied by

Spanish Details

A Highly Practical Work on the Spanish Renaissance

By William Lawrence Bottomley

IN this volume there is presented a collection of illustrations and measured drawings of carefully selected details of Spanish Renaissance architecture. The work of a New York architect who has been notably successful in attractive use of Spanish motifs in his own practice, the volume presents not so much work of a striking and magnificent character as what is comparatively moderate in scale and therefore adaptable for present-day use in America.

The volume is replete with illustrations of well chosen, simple Spanish facades, doorways, windows, balconies, balustrades, exterior stairways and the grilles of wrought iron or carved and turned wood which are used at gates, windows and doorways. Interior details include the arcades of patios, ceilings, chimneypieces, floors, doors, shutters, wall fountains, etc., and since in most instances the illustrations are accompanied by measured drawings the reproduction of these details is not difficult.

Of all the recent works on the Spanish Renaissance this is perhaps the most practical for actual use.

Frontispiece in color; 104 plates and measured drawings, 11 x 13¾ ins. In portfolio form, $12.50; if bound, $15.

ROGERS & MANSON COMPANY

383 MADISON AVENUE NEW YORK

French and English paper designers, and this really created an almost distinct period, influencing not only wallpaper but the design of furniture and lesser architectural detail as well. Some wonderful Chinese papers are preserved in this country, notably in the Hooper mansion in West Manchester, and the Dorothy Quincy House in Quincy, and the writer had the pleasure of helping to install in a sympathetic architectural setting that marvelous Chinese paper now in Mr. Merriman's house in Providence, illustrated in this volume.

The high period, we are told, of greatest excellence of technique and artistry, was that in which, departing from the strictly imitative, paper was designed and printed to produce the same effects as mural decoration, hitherto to be had only by the expensive employment of eminent artists, and to be afforded only by the rich. Reveillon, with his small capital of 18 francs but with the priceless inspiration to employ for his own designers those very painters most in vogue and to reproduce their work by means of his amazing knowledge of the technique of printing, produced panels of such a high degree of artistic merit as to make it possible to combine them with the pretentious architectural details of the period, such as carved panel mouldings and elaborate door heads, taking the place of painted decoration. We are shown illustrations of one of Reveillon's most noteworthy creations, a series of panels, "The Five Senses," classical figures and detail in tones of gray against a blue-green background.

The industry continued through the vicissitudes of the Revolution, surviving the depressing effects of the Terror in a remarkable way, where other enterprises were destroyed, and reflecting faithfully the change in taste from the delicate flowers, ribbons and lovely tints of the Louis XVI period to the harsher military spirit of the Directoire, Consulate and Empire with their characteristic detail of battle axes, lances, spears, shields and cruder color schemes as architecture and decoration mirrored the history of the times.

Miss McClelland gives us in "Period Five, or the Epoch of Scenic Papers," what is perhaps the most interesting of all the subdivisions of the subject; for the picture papers, we must admit, appeal most strongly to our fancy and illustrate by subject the close relations between France, the country of their origin, and America at the beginning of the nineteenth century. Again, they are the papers with which we are most familiar, speaking from a decorative viewpoint, and their origin in France, their journeyings across the seas in the cabins of sailing vessels, and the hanging of them in stately New England homes cannot fail to stimulate our romantic interest.

The limits of a review make impossible further discussion of the quantity of detail contained in this history of wallpaper, but mention must be made of the delightful introduction by Henri Clouzot, Conservateur du Musee Galliera, Paris, the wealth of illustrations, 12 in color and 245 in halftone, grouped very conveniently for reference, the alphabetical list of names connected with the industry from 1500 to 1840, a table of the more important French papers of the eighteenth and nineteenth centuries, a bibliography and a chart of important dates in wallpaper history. Miss McClelland's "Historic Wall Papers" is an enjoyable, valuable and most welcome addition to the literature dealing with decoration.

LUMBER AND ITS USES. By R. S. Kellogg. Revised by Franklin H. Smith, 370 pp., 6 x 9 ins. Price $4. U. P. C. Book Co., Inc., New York.

ALTHOUGH wood is by far the most used of all building materials in America, it is surprising to find that less is known regarding its nature, properties and economical use than of most other materials. A steel rail is made according to a formula prepared by a metallurgist; there are standard mixtures for cement and concrete; the physical properties of metal and stones are accurately known; but even the best grading rules of the lumber manufacturers are only approximations to the actual values of different classes of lumber. Then too, the waste which occurs in connection with lumber manufacturing, notwithstanding the great improvements which have been made in the industry, is enormous; not more than from 25 to 50 per cent of wood in a tree, we are told, reaches an ultimate user,—a striking example of truly American waste! Because our forests have seemed to be inexhaustible there has appeared to be no need for finding uses for the portions of a tree which could not be utilized for lumber. The timber-using public has taken the cream, and no one would look at the skimmed milk. Consequently the owner of the milk could only throw it away. The toll taken by waste has been prodigious beyond belief.

Aided by the technical and statistical studies which for some 20 years have been carried on by the United States Forest Service, Mr. Kellogg here presents a treatise on wood and its uses. The physical properties of wood are discussed, its structure, and the various kinds of wood and the difference between woods of the same general kind. But perhaps the use of wood is more important as well as more interesting, and the author deals with topics such as Cutting; Seasoning; Grading; Standard Sizes; Preservatives; Use of Paints and Finishes, and much is said regarding uses of wood for various purposes in building. Mr. Kellogg sees no danger of a "timber famine," due chiefly to supervision over forests which will probably be assumed by federal or state governments, enforced by suitable legislation.

DRAFTING ROOM MATHEMATICS. Problems of the Drafting Room Simply and Clearly Explained for the Draftsman and the Architect. By De Witt C. Pond, Author of "Concrete Construction for Architects." 153 pp., 5¼ x 7¾ ins. Price $2.50. Charles Scribner's Sons, New York.

PRACTICE of architecture in certain of its phases is scarcely to be distinguished from actual engineering. In even the simplest types of building of many kinds there are such matters as strain and stress to be taken into consideration, so that even the most elementary building involves some use of mathematics. In the drafting rooms of engineers the solving of problems by means of algebraic formulæ is important, but architectural draftsmen as a general thing have more use for the kinds of calculations which enable them to determine distances and angles in cases where their structures are complicated by being designed to fit irregular plots.

This volume is a treatise upon such mathematics as are likely to be required by an architect. Written by an architect of wide training and experience, it covers in a work of ordinary size a field which is of vast importance, but regarding which there is not a great deal of information easily available. The work is well worthy of study.

Small Houses for the Community

By C. H. James and F. R. Yerbury
Foreword by Raymond Unwin

ENGLISH architects have been particularly successful with their handling of the "small house problem," whether the small houses be individual buildings or in the groups which are usual when a number of houses are erected by some one interest or by some industrial concern for housing its employes.

This book gives an excellent presentation of the best of such work, illustrations of the exteriors and interiors of houses of various types and materials and the floor plans making plain the results of economy of material and floor area which present-day building conditions demand. A valuable summing up of a subject which is of interest to architects everywhere, particularly to those whose work is largely of a domestic character.

Text, 140 Halftone Plates and Appendix, 10x12 ins. Price 31s, 6d.

ROGERS & MANSON COMPANY
383 MADISON AVENUE NEW YORK

OLD HOUSES OF CONNECTICUT. Edited by Bertha Chadwick Trowbridge, and Charles McLean Andrews, of Yale. 519 pp., 8½ x 11 ins. Limited Edition. Price $25. Yale University Press, New Haven, Conn.

SOCIETIES which exist for the safeguarding of patriotic tradition may well find an additional aim in furthering the preservation and study of early architecture in America. The early settlers in what are now the states along the Atlantic seaboard, when once they began to build permanent homes at all, built them of strength and solidity which have enabled them to last in many instances for almost three centuries; but even homes built by the American colonists are not proof against the ruin and decay which follow neglect, and many of these venerable buildings have reached a condition which demands that their architectural excellence be recorded and preserved unless their merits are to be forever lost to the world. The important work of rendering possible the study of the old houses of Connecticut, has been undertaken by the Society of Colonial Dames, and is promoted in this handsomely produced work, compiled from material collected by the Committee on Old Houses, and published on the foundation established in memory of Calvin Chapin, Class of 1788, Yale College.

The parts of Connecticut covered by this study yield an astonishing number of fine houses, which range from the simplest and most austere buildings to others which are of surprising luxury and richness. The work deals with 64 of these old structures, each house being given many illustrations of exteriors and interiors. The value of the volume to architects is great, since in addition to views of exteriors and interiors there are floor plans of the buildings and measured drawings of many details as well as carefully compiled lists of the materials used. The volume is literary and historical as well as architectural, and the illustrations and plans are accompanied by descriptions which aid in visualizing these old houses.

ARCHITECTURE IN ENGLAND. By Cyril Davenport. 154 pp., 4 x 6½ ins. Price $2.40. E. P. Dutton & Co., New York.

IT is not easy and perhaps not even possible to present in a volume of "pocket size" a view of a subject as large as English architecture which would be sufficiently comprehensive to possess value for the student or interest for the casual reader. For this reason it might almost seem to be a mistake to issue a new work which differs little, if at all, from quite a number of small volumes which aim at nothing more than being synopses or outlines of more complete works. It might be replied, of course, that it is not easy to persuade the public to study architecture at all, and that to encourage such reading the matter must be frequently presented anew, condensed into small compass and so written that no heavy demands are made upon either the imagination or the understanding of the reader. There is always hope that by suitably encouraging a reader his interest may be captured unawares, and thus there be one more student of history for whom the architecture of the ages actually lives anew.

This little volume may therefore be regarded as a missionary effort which might well perform excellent work. It has been well written and adequately illustrated.

COLONIAL INTERIORS

Photographs and Measured Drawings of the Colonial and Early Federal Periods

By LEIGH FRENCH, Jr., A. I. A.

INTERIOR woodwork during the Colonial and early Federal periods was exactly what is demanded for "Colonial" interiors today. The character of workmanship in the colonies insured craftsmanship of excellent quality, and this, together with design carefully studied from the simpler contemporary English work, resulted in woodwork which it would be difficult to improve upon. For this reason close study is being made of such old American interiors as still exist, and measured drawings make possible the reproduction today of much of the finest woodwork of the seventeenth or eighteenth century. These forms, while they involve not a little subtlety in the details of design, demand merely the use of simple mechanical processes which are not beyond the skill of any reasonably proficient woodworker, sometimes of an ordinary carpenter.

IN this valuable work on the early American periods there are given illustrations from new photographs of interiors of the time, many of which are little known. These illustrations are of rooms of different kinds and of widely different types,—the early, somewhat severe type as well as that which was later and more refined and luxurious. Valuable illustrations are supplemented in many instances by invaluable working drawings,—details of wall paneling, mantels, over-mantels and fireplace surrounds; door and window trim; china closets; newels, balusters and other details of stairways, and designs for the stenciling of floors, together with notes on the colors originally used. It is a volume which in its practical usefulness will be of great value to architects whose work involves much use of early American interior design.

125 plates, 10 x 15 inches. Price $15

ROGERS & MANSON COMPANY - - - 383 Madison Avenue, New York

THE EDITOR'S FORUM

CHANGING EDUCATIONAL TENDENCIES

IN a recent report to Dr. Nicholas Murray Butler, President of Columbia University, the Director of the School of Architecture of Columbia, William A. Boring, records some of his impressions of the International Congress on Architectural Education, which recently concluded its sessions in London.

"American architects," Prof. Boring declares, "are both artists and philosophers, comparable in their cultural associations to those of Greece and Rome." Planning he calls the basis of architecture, saying that "training demands knowledge of construction."

"The keynote of nearly all the discussions of the Congress impressed one as insistence on expression of modern ideas of physical needs of society, and of modern methods of construction," says the report of Prof. Boring, who is Treasurer of the American Academy in Rome. "Insistence was recorded on expressing modernity. The need of beauty was not stressed, nor was the cultivation of taste made an issue. This is, no doubt, a healthy sign. The feeling that we are leaning too much on the use of good old forms which have been overworked augurs something vital, but this idea alone cannot lead us to success in architectural design.

"Knowledge of structural materials and their uses, excellent craftsmanship, even good detail, are not the broad basis of good design. To place these in the forefront of an educational scheme seems narrowing. The disposing of masses after analysis of the problem is more important. Planning in its broadest sense is the basis of architecture.

"Architecture as a profession should rank in the public mind as on a par at least with law and medicine. We cannot maintain it so by teaching the craft alone. We must turn out scholars who are masters of craft also. In America our architects of distinction move in the highest intellectual circles, as they did in Greek times. They are men of culture, of science, of good taste, and have a knowledge of building processes as well as of good design.

"Much has been said about commencing early to learn architecture, and no doubt early familiarity with good buildings is an advantage. Our experience, however, shows that college bred men who come rather late to the study of architecture are the strongest men in our school. Learning to draw early is almost essential, and facility in this method of expression is a great advantage. Some have it naturally, others must acquire it, all must master it. But the art of architecture is greater than its expression on paper. Only a limited number of aspirants reach the plane of real architects. Schools should teach such subjects and in such a way as to bring out and develop the student's natural gifts.

"We must recognize that a person of great talent will succeed either in or out of a school, but he will have a better basis or foundation for his work if he has had good school training. A school should give him those things as basic ideas which he can learn in practice only by going through and rising above the maze of details. Four years are not enough time for a high school graduate to reach the proficiency represented by our degree. If a curriculum includes general educational subjects, it should be longer than four years because the professional instruction alone requires at least that much time. The average student who has not advanced beyond high school grade is not sufficiently developed to properly approach the major subjects taught in a professional school. He can very well be taught by allotting six years from high school to diploma, on the plan of a combined course which begins by mixing the elementary subjects in his professional studies with his general college curriculum."

JOSEPH HOWLAND HUNT

AS part of the heavy loss which the Profession has sustained during 1924 came the death on October 11, of Joseph Howland Hunt. As a son of Richard Morris Hunt he fell heir to distinguished architectural traditions, and after preliminary study at St. Mark's and Harvard he entered the Columbia School of Architecture and studied for some years at the Ecole des Beaux Arts. After considerable travel in Europe, chiefly in France and Spain, he joined his brother, Richard Howland Hunt, in continuing the practice established by their father, and in 1911 the brothers formed the firm of Hunt & Hunt.

Mr. Hunt was prominent in spheres other than that of architecture. He was a Director of the Municipal Art Society from 1916 to 1924, and President from 1919 to 1923; First Vice-president of the National Sculpture Society from May, 1921 until May, 1923; Secretary of the Fine Arts Federation from 1904 until 1916; Treasurer of the Architectural League of New York from May, 1912 until May, 1914; a member of the American Institute of Architects, Society of Beaux Arts Architects, Municipal Art Society, Architectural League of New York, National Sculpture Society, and Metropolitan Museum of Art.

Perhaps none of the personal characteristics which accounted largely for Mr. Hunt's wide circle of friends will be remembered with such pleasure as will his winning geniality and the bright optimism with which he regarded life, and his unfailing consideration toward those with whom he came in contact.

You business men, impatient of delays, stop shutting yourselves up into plaster walled prisons — stop waiting, through weeks of dirt and confusion, every time you have to change your office layout.

Build your office walls as you have built your business, with visions of expansion and a plan for the future.

Telesco Partition is so simple to erect or take apart, that any carpenter can do it, with his principal tool a screwdriver. These are the interchangeable units.

Telesco Partition
REG. U.S. PAT OFF.
IT TELESCOPES

Your Visions of Growth Can Always Come True With Movable Telesco Partition

THESE cabinet-finished walls, beautiful beyond belief, stand staunch as a rock, yet can be moved in a few hours' time to make any layout you want.

The office you need is the one you will have, at no expense but a few hours of a carpenter's time.

Telesco Partition is a wood and glass partition, screwed together, and with an extension top, making alterations unnecessary when placed under a higher or lower ceiling. It can be extended from 8' to 13' or more. Its interchangeable sections come in any wood or finish that you want.

For new buildings, the approximate footage required can be ordered and set in place as needed. For older buildings, you can always be sure that what you order will fit where you need it.

The testimony of thousands of users all over the country, and our catalogue, will convince you that Telesco Partition is the most economical and the most beautiful partition you can buy.

Send today for catalogue.

IMPROVED OFFICE PARTITION CO. 25 GRAND ST. ELMHURST, NEW YORK, N.Y.

The
ARCHITECTURAL
FORUM

Volume XLI DECEMBER 1924 Number 6

The New Arrowhead Inn

DWIGHT JAMES BAUM, Architect
By MATLACK PRICE

IN the country outside Rome the Italians of the Renaissance built themselves great villas and gardens as places of retreat and refreshment, away from the stress of the city. Rome itself, in those days, could have imposed less pressure on its dwellers than one of our own suburbs of today, and it is doubtful if the most imaginative of the Renaissance Italians could have conceived of the pressure under which the present-day dweller in New York lives,—unless it were Dante, when he wrote the Inferno.

History, both human and architectural, inevitably repeats itself, so here, within half an hour from the heart of New York, a gracious and restful Italian villa has been built for Benjamin C. Riley, as a restaurant de luxe—the new "Arrowhead Inn"—by Dwight James Baum, Architect. Proprietor and architect, certainly, have joined in accord to good purpose, for this great Italian villa is successful in the only two ways in which such a building needs to be successful,—it is attractive and practical. It is attractive because it is designed with skill and imagination, in an essentially picturesque style of architecture; and it is practical because it is designed with intelligence and a thorough grasp of the special problems involved in a building of its type.

More than these two architectural points, the picturesque and the practical, the enlistment of architecture in providing a setting for dining de luxe has definitely proved to be good business. This I have on the personal testimony of Mr. Riley himself, who has been in the business of managing an out-of-town restaurant for 17 years. In spite of the well known public indifference to architecture, good or bad (an indifference which every architect has felt at one time or another), Mr. Riley told me that a great many people had commented on the architectural setting he had provided for them, when, in former days, they used only to comment on the meals. And, largely by reason of this new and attractive environment, he expects to keep "Arrowhead Inn" open all winter, and to have a patronage that will make it worth while to do so.

Even a brief analysis will serve to show how the architect achieved a successful building in conformity with the necessarily special requirements

Architect's Rendering of Building and Gardens

THE GARDEN FRONT OF THE INN WITH ITS HIGH STONE TERRACE AND BROAD STEPS

THE PAVED DANCE FLOOR ON THE EASTERN LAWN

THE NEW ARROWHEAD INN

DWIGHT JAMES BAUM, ARCHITECT

involved. "Arrowhead Inn," built on a generous though not unlimited expenditure, seems to prove that economy of architectural means is by no means always a handicap, but may act as a stimulus when vision and resourcefulness are among the attributes of the architect. I think it could be made a demonstrable theory that economy of means forces the hand of the architect to make the most of every architectural opportunity afforded by the whole project, and thus makes for the attainment of strictly architectural values, rather than values resultant from superficial means, such as the use of showy materials, or from the mere profusion which an extravagant outlay can command.

The first architectural asset in the design of "Arrowhead Inn" was, obviously, its site, a commanding knoll of wooded land, broken with picturesque outcroppings of gray ledge rock. A raised site naturally aids the impressiveness of any building, and here the architect developed the design to express an effect of mass, made picturesque by his device of two towers of differing breadths and heights, differently treated. These serve to interrupt what would otherwise have been a monotony of horizontal roof lines and arched windows, and effect at the same time an interesting lack of symmetry in the whole composition.

The immediate foreground of the building, at present uncompleted, will consist of formal Italian garden terraces, with stairways and balustrades,—an outdoor eating environment of unusual attractiveness. With gay awnings and Deauville umbrella tables by day, and soft lighting effects by night, the whole outdoor aspect of the Inn will possess a truly Continental glamor, and as compared with provision for the 950 guests served on the temporary terrace this past summer, accommodation is being made for 1500 or more next summer, with *al fresco* entertainment as an attraction added to the present outdoor dance floor. This floor, by the way, is made of squares of alternating colors, waxed, the same material being used for the interior floors of the lobby and dining rooms.

The main mass of "Arrowhead Inn" is approximately 200 feet square, of hollow tile construction with cream-yellow stucco and roofs of handmade Italian tile in a range of dull reds. This roof distinctly escapes the mechanical effect of many roofs of its type, and is equaled in character only by a few in southern California.

The Italian villa, as an architectural type, has served most often in this country as a basis for the design of country houses, notably the fine and scholarly examples by Charles A. Platt. Seldom has it been utilized as Mr. Baum has adapted it for "Arrowhead Inn." The villa style in its simpler forms, not considering the Baroque elaborations of the later Renaissance, is peculiarly adaptable both in

One Corner of the Women's Reception Room

Entrance from the Lobby into the South Dining Room

its essentials of design and of construction.

In its design this type of Italian architecture demands, primarily, good proportion in its masses and in its large, plain wall areas. It demands no great profusion of detail, but requires good judgment in the allocation of detail and the best possible sense of scale in its execution. The effectiveness of "Arrowhead Inn," certainly, does not depend on its detail, but upon its general proportions, and the relation of its main masses. Its front elevation possesses balance without symmetry. Between the two towers there is enough difference to emphasize this point as the center of the building, but not to the extent of throwing the long wings out of keeping. The close spacing of the three arched doors opening on the terrace from the lobby, and the deep shadow in the loggia above them accomplish all that is necessary at this point in the main facade. To have repeated the balcony and window of the right-hand tower on the tower at the left would have been to force an unnecessary symmetry.

In point of color this villa architecture may be carried out with as much or as little as may be required. In much of the recent work in Miami, in Florida, the architects have been mixing mineral pigments very liberally with the stucco, obtaining highly colorful results. A stucco exterior, at one time, was considered rather colorless and uninteresting, but its more recent developments have shown that it may be rich in color and interesting in texture.

A Spacious Lobby, Vaulted in the Italian Style, Occupies the Center of the Entrance Floor

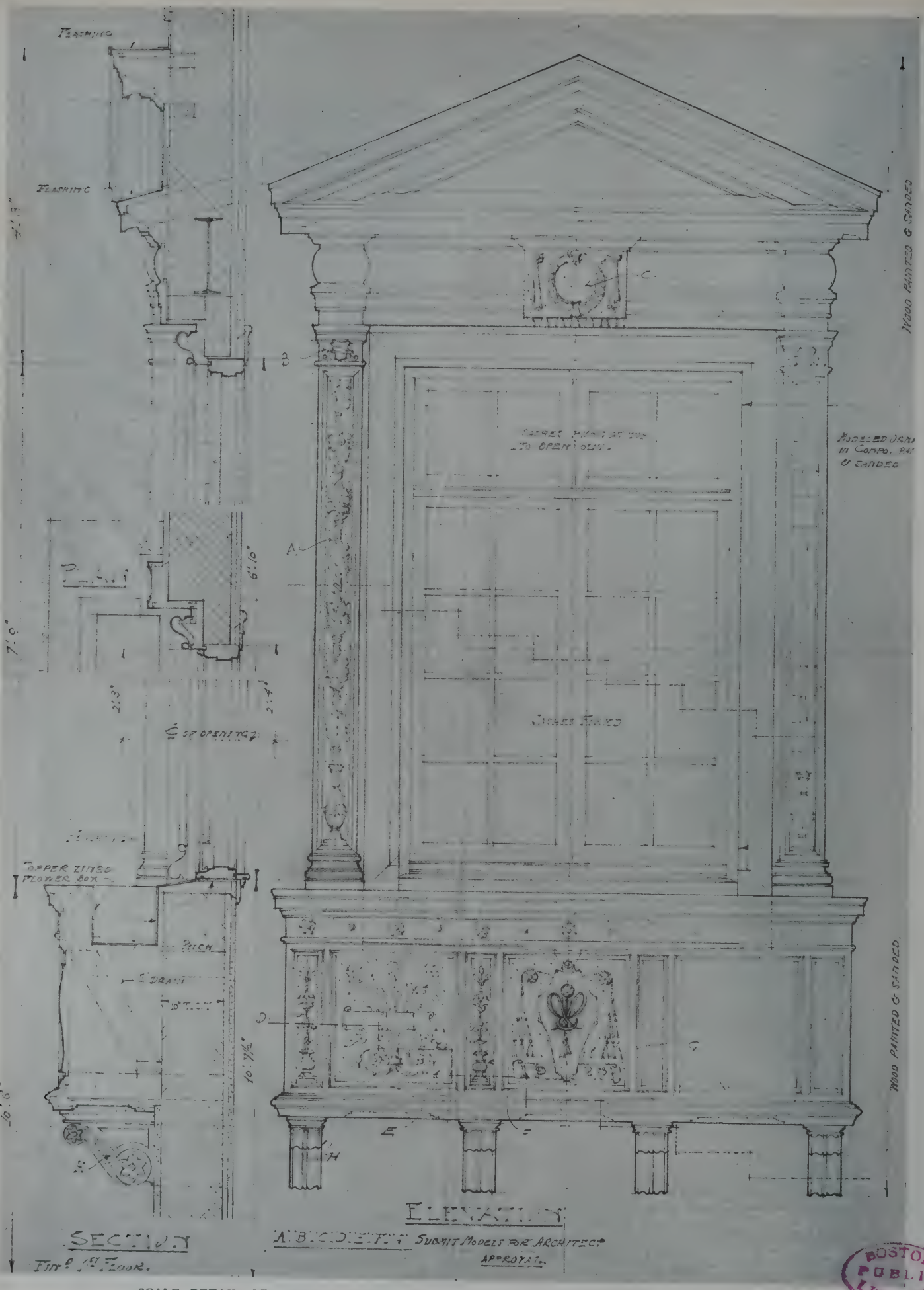
In the "Arrowhead Inn" exterior stucco, no color effect beyond a rich cream has been attempted, and the texture is interestingly rough without being exaggerated. This raises the point of technique, which is a very important matter in the rendering of Italian architecture, and one in which many examples in this country have conspicuously failed. Even with excellent general proportions, a building that purports to be in the villa style of Renaissance Italy entirely misses its effect if its execution in detail is hard or mechanical. An easy quality of informality is quite as important as the scholarly element, —perhaps it is more important. Recent analyses of the work of some of the great Renaissance architects, especially of the work of those who have written treatises on architecture, with pedantic rules and formulæ, have shown that they themselves paid little or no attention to the rules when the rules interfered with the thing they wanted to do.

It is the quality of informality that contributes greatly to the success of "Arrowhead Inn," making it not only good design in itself, but fitting and appropriate for its purpose as well. The same general scheme carried out unimaginatively and with any degree of self-consciousness would have missed the effect that has been so successfully attained here.

One problem with which the architects of Italian villas of the Renaissance did not have to concern themselves was the provision of parking space for automobiles,—a very real problem in connection

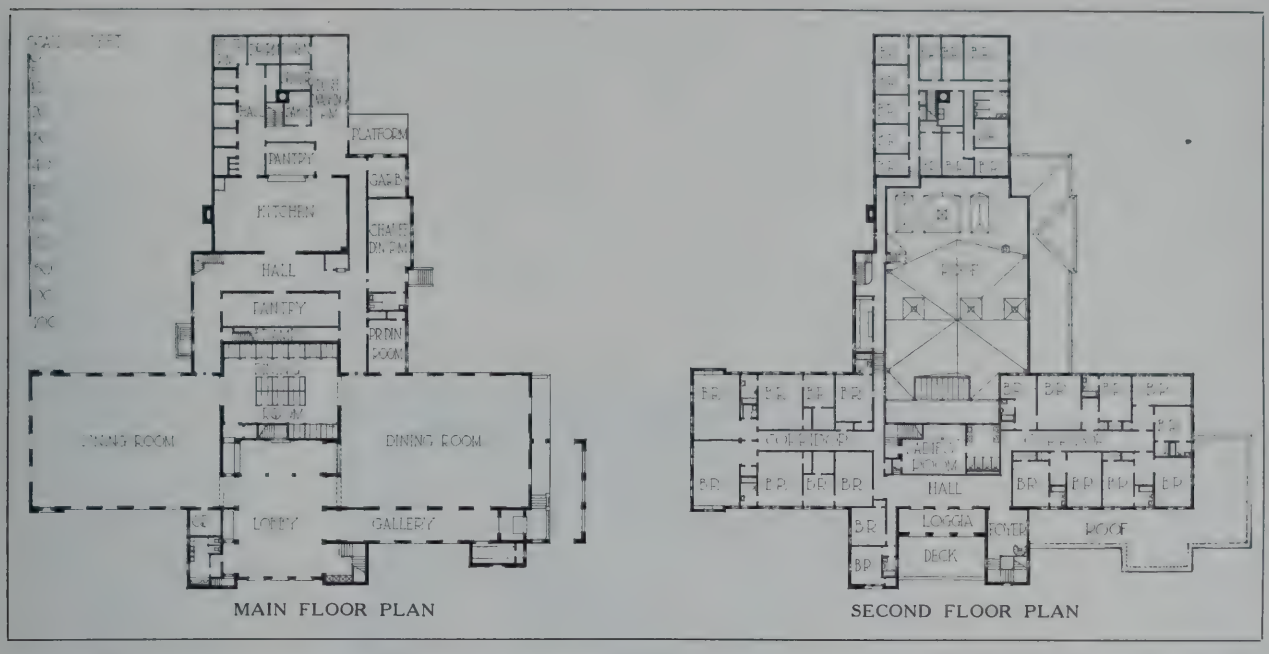
The Long Entrance Corridor

The Northern Dining Room Is Provided with a Dancing Floor About Which the Tables Are Grouped



SCALE DETAIL OF THE FLORENTINE WINDOW AND BALCONY, NEW ARROWHEAD INN
DWIGHT JAMES BAUM, ARCHITECT

BOSTON PUBLIC LIBRARY



MAIN FLOOR PLAN

SECOND FLOOR PLAN

THE ARCADED ENTRANCE AT THE NORTHERN END SHOWS THE FINE ITALIAN SPIRIT OF THE DESIGN

NEW ARROWHEAD INN, NEW YORK

DWIGHT JAMES BAUM, ARCHITECT

with such a building as "Arrowhead Inn." Extensive space was planned in the general layout here, but it will need to be increased next summer. This expansion is not to be attributed to inadequate planning, but to modesty as regards the restaurant's popularity and to greater patronage than was anticipated.

The plan of the building, so far as the public spaces are concerned, is simple. From the *porte cochere*, through an interestingly detailed pair of doors of wood, iron and glass, a long vaulted corridor, about 70 feet in length, leads to the lobby, which is about 50 feet square and a story and a half in height. The walls in both corridor and lobby are of rough textured plaster, colored a warm buff. The lobby, lying between the two large dining rooms, contains the office accommodation and space for the orchestra, and because of its almost complete absence of architectural detail it depends for its effect upon such purely architectural points as proportion and the treatment of its windows and other openings, which are excellently managed.

An Open Loggia Emphasizes the Center of the East Facade

The walls of the two large restaurants are finished with the same rough plaster effect as the corridor and lobby, and both restaurants have ceilings of pecky cypress, very simply detailed and given an antique finish, later to be embellished with a little decoration in color, in the Italian or Spanish manner. The commendable thing about the dining rooms, as about the whole atmosphere of the place, is the restful, satisfying simplicity of its architecture, both outside and in. There has been no striving for superficial effects, and the result is an environment that cannot but be appreciated as a real escape from the insistent profusion of most city interiors, and of the whole feeling of the city, which, in this great, quiet villa, seems as though it must be at least a hundred miles away.

Connecting the two restaurants, behind the lobby, lies a third and smaller restaurant where 20 couples can dine in semi-privacy in booths. Each booth or alcove has its Italian table, and high-backed seats, covered with leather which is studded with bronze nails. This small restaurant has its own dance floor, and its chief architectural feature is its vaulted plaster ceiling which confers distinguished character.

In planning the kitchens it was necessary to provide adequate facilities for serving a considerable number of guests, and the equipment had to be as large and as complete as that of one of our great modern hotels. The kitchens and pantries, all of which have outside ventilation, are unusually large, and the layout includes separate refrigeration rooms for all kinds of perishable foods, special pastry pantries, ice cream rooms, supply storerooms and linen rooms. Every detail of convenience is provided.

The greatest problem of all, however, in laying out the kitchens was to arrange them so that a three-way service, to both the restaurants and the terrace out doors, could be managed without the confusion of waiters or guests crossing one another's paths. The proprietor, with years of restaurant experience behind him, admitted that he had never been able to see how a three-way, non-colliding service from one kitchen could be worked out; the architect's solution was to place the kitchen between the two large dining rooms, an obvious expedient, and to serve the terrace through a tunnel, an expedient not so obvious — in fact, highly ingenious; the result is an arrangement by which neither patrons nor waiters can ever cross one another's paths.

"Arrowhead Inn" is entirely a restaurant, the apartments on the second floor being the private residence of the proprietor and his family. Its atmosphere, unlike that of many similar places, is pleasantly like that of a large country house or club. It is refreshingly un-metropolitan and un-urban, and in spite of its large scale it succeeds in giving a feeling of privacy and exclusiveness. For this the credit is due to architecture and the architect, and it constitutes much of the latter's real reward for not only doing all that the problem required, but a good deal more. Far too often this type of building entirely fails to realize its architectural opportunity. "Arrowhead Inn" not only realizes its architectural opportunity but improves upon it.

"Arrowhead Inn" may well come to be cited as a specific and definite proof that good architecture is a good business investment, a truth which, to many materialists seems to need such demonstrations.

The Roosevelt Hotel, New York

GEORGE B. POST & SONS, Architects

ANOTHER great hotel has been added to the so-called "Grand Central group" in the heart of New York. This great hostelry of 1100 rooms, which rises to a height of 22 stories above the street, has been named "The Roosevelt" in honor of the renowned late president.

The exterior, which is designed in a modified type of Italian Renaissance architecture, is constructed of Indiana limestone with terra cotta trimmings, except at the street level where the first story, containing numerous shops, has been emphasized by the use of Belgian Black, and black and white Grand Antique marble imported from the south of France. This treatment makes an effective enframement for the shops which fill three of the fronts of the building, but prevents a uniform and consistent architectural treatment of the facades from the sidewalk to the cornice lines. The facades, with their deep setbacks on the Madison and Park Avenue sides, rise to a height of 17 stories before the first cornice line is reached. Even this height is broken on the Park Avenue side, where lower setbacks occur on the 11th and 14th floor levels. The Roosevelt is the first large New York hotel to be built since the going into effect of the zoning law, which has produced what is known as the setback type of architecture. Beginning on the 16th floor, due to these setbacks, many of the guest rooms open out on individual roof gardens, an attractive feature which no other city hotel has yet been able to offer to its guests. Each little roof garden will be given the necessary privacy by latticed screening, over which vines will climb in summer, and gay colored awnings, tea tables and easy chairs will add to the comfort and gayety of these little gardens.

The plan of no modern hotel has been more carefully studied from the point of view of completeness of equipment and convenience of arrangement than has that of The Roosevelt. No detail which could possibly add to the comfort or convenience of the guests has been omitted. From the point of view of investment the plan has also been thoroughly developed, as is demonstrated by the arrangement of stores on the three street sides of the ground floor which open also upon the interior arcades. These hotel shops will therefore serve not only the public from the sidewalks but also the hotel guests from the interior corridors. A large proportion of the ground floor area has been devoted to store space, yet this has been accomplished without any sacrifice in the disposition of the public rooms. The relation of all the public rooms throughout the first three floors is in accord with modern metropolitan hotel requirements.

A study of the hotel plan, floor by floor, discloses these arrangements. Three subcellars are located under the Madison Avenue side of the hotel and extend back as far as the trackage space of the Grand Central Terminal permits. The eastern half of the hotel, which is built over the incoming tracks, has no subcellars, the ground floor being the first floor entirely covering the block bounded by the four streets upon which the hotel fronts. In the lowest of the subcellars are located the engine room, with its refrigeration and power plants, and a complete laundry for the hotel and its guests. This laundry is connected with the hotel proper by a chute through which linen can be sent down directly from any floor of the hotel. In this subcellar is also located a large incinerator which likewise connects by a chute with all the floors. The second subcellar is devoted to the steward's department. Here all goods for the hotel are received, stored and distributed. Eight refrigerators, one each for fish, meat, fruit, smoked meat, poultry, butter and milk, cheese and vegetables, insure sanitary storage of food. Other features of this floor are an ice cutting machine, where fancy table forms will be made, an ice cream room for the moulding of frozen table decorations and desserts, a bakery with two ovens to produce the daily supply of various kinds of bread and rolls required, storage room for silver, linen, etc.; a large room with labeled racks for trunk storage, and a mechanical workshop for engineers, plumbers, steam fitters and electricians complete the equipment of this floor. The first basement or subcellar below the street level contains storage space for some of the shops above, kitchens and cafeteria for the hotel servants, locker rooms and other service features.

In addition to the 18 shops on the ground floor, there is located on the Vanderbilt Avenue side of the hotel a restaurant or grill with center dancing floor, around which a low balcony or terrace with wrought iron handrail provides a pleasant place for dinner or supper for those who enjoy dancing. Serving this restaurant are the pantry and service halls and elevators which connect with the main kitchen of the hotel on the floor directly above. On this ground floor are the two main entrances to the hotel. From these entrances the main floor is reached by monumental stairways, and the shops and grill room by long arcades which extend through to 46th Street and Vanderbilt Avenue. "The Mayflower Grill," so-called, is designed in the Colonial style, and is interestingly lighted by chandeliers and wall brackets in keeping. The main floor, upon which are arranged all the principal public rooms of the hotel with the exception of the ballroom suite, shows a consistent and intelligent arrangement of rooms along the three principal street sides of the building. Broad, easy stairways lead from the

entrance vestibules on 45th Street and 46th Street up to the main lobby, which occupies the center of the front part of this floor. In this lobby are located the main offices on one side and the six passenger elevators directly opposite. On the Madison Avenue side, parallel with this lobby and raised a few steps above it, extends a long, narrow lounge. Over the entrance vestibule on the 45th Street side is the oval Palm Room, which serves as a foyer or reception room for the large, formal dining room at the southeast corner of this floor. Stateliness and dignity have been given to this dining room by the height of the ceiling (the room extends through two stories) and by raising the floor three steps above that of the Palm Room.

One of the delightful and artistic features of this hotel is obtained by the many different levels of the public rooms. At the northeast corner of this main floor are located two breakfast rooms which also are on a higher level than the main lobby, necessitating an approach of several steps. The public rooms of this floor encircle and surround, in a U-shaped plan, the large main kitchen with its various pantries and service rooms. From this floor also, by means of a long staircase, the underground corridor is reached, connecting The Roosevelt with the Grand Central Station.

As the main lobby, the Palm Room and the large dining room, are two stories in height, only three-quarters of the mezzanine or ballroom floor above is available for rooms. Over the main kitchen and connecting with it by a large service pantry is the ballroom with its adjacent foyer and small banquet room. With this ballroom suite are connected six private dining rooms and a spacious library along the 46th Street side. This excellent plan makes it possible for many private dinners to be held in connection with any entertainment in the ballroom. On the Madison Avenue side of this floor are located a beauty parlor for women, a dressing room, toilets, and a large barber shop. The location of the kitchen is particularly practical and logical. Located in the center of the eastern side or rear of the hotel, it serves not only the grill on the basement floor, which is directly below it, and the main dining room and breakfast rooms which are located on either side of it on the main floor, but also the ballroom suite and private dining rooms on the mezzanine floor above. This centralization of the culinary department is one of the most interesting and practical features of The Roosevelt's plan.

There are no long flights of stairs for waiters to climb, and all of the rooms have daylight and fresh air, unusual with hotel kitchens, which are often located on basement floors below the street level. The equipment of the kitchen includes four large motor-driven machines to wash and sterilize the dishes and silver, an electric machine to peel

Photos. Drix Duryea **Main Office Adjoining the Entrance Lobby. The Roosevelt Hotel, New York**

potatoes, and another machine equipped to whip eggs, cream, etc. Two brick ovens weighing 85 tons provide the means for baking bread; another machine mixes flour in large quantities; 26 gas ranges, 12 gas-charcoal broilers and six large soup caldrons complete the equipment. Separate refrigerators which are provided for various foods are cooled by machinery with individual, control temperature equipment. All serving and work tables are of metal to prevent rust or any other form of corrosion. The floors of the kitchen and service rooms are of red tile with sanitary coved bases.

Above the mezzanine is the second or service floor, which has been equipped with every convenience for comfort that modern ingenuity and invention have produced. A Turkish bath and plunge occupy the center of this floor, around which are located temporary guest rooms or booths, 50 in number, 25 of which have cots and are fully equipped as dressing rooms. These small rooms, which are a new feature in hotel service, have many uses; guests who arrive when the hotel is full can be temporarily accommodated in these rooms, which will also be found useful when men and women after a day in town wish to change their costumes for an evening at the theater. The cost will be but a fraction of that of the regular rooms. Various executive offices and additional private dining rooms, hair-bobbing parlor, telephone switchboard rooms and linen room are also located on this floor. The principal feature of the third floor is the hospital, completely equipped with operating room, waiting rooms, and examination rooms, where a physician and trained nurse are always available. On the Vanderbilt Avenue side of this floor provision has been made for a roof garden over the ballroom, where tea and dancing may be enjoyed in an atmosphere of fountains, flowers and bright colored awnings. The remaining floors of the hotel are devoted to guest rooms, arranged so that they may be used singly or in suites. There are four large suites on the upper floors which will be furnished in the most luxurious manner possible. Each of these suites consists of a drawing room, dining room, three large master bedrooms and baths, dressing room, maid's room and separate pantry. On the 14th floor will be a playroom for children, to be known as the "Teddy Bear Cave," which will be furnished with toys and games of every description and in charge of a competent nurse who will care for children during the absence of their parents throughout the day. Adjoining this playroom is a sunny roof, adequately protected, where the children may play in pleasant weather. The 18th floor is devoted to carpenter, upholsterer, locksmith, paint and printing shops, valet headquarters and other indispensable service departments. On the 19th floor have been located kennels

Opposite the Hotel Office Are the Several Elevators

Ballroom, Showing One of Arthur Crisp's Panels

and runs for dogs belonging to the guests, and individual cages where pets of any kind may be cared for by an experienced veterinarian.

Great credit is due to the architects of the Roosevelt Hotel, George B. Post & Sons, who were the engineers as well. They have succeeded in creating a most perfect structure, architecturally and mechanically, for the care and comfort of the traveling public. The engineering problem in itself was not simple. The foundations of The Roosevelt rest on lead pads on solid rock, thereby eliminating any possible subsurface vibration affecting the building, the total weight of which is 1153 million pounds. In some cases the weight carried by one steel column at its base is 4,000,000 pounds. The guest room floors are supported over the clear span of the public rooms below by steel trusses 53 feet long, the maximum load carried by a single truss being more than 3,000,000 pounds. 10,000 tons of structural steel were used in the construction of the building, the total cost of which was over $12,000,000.

For the interior architecture and decorations of the Roosevelt Hotel, the architects took as their inspiration the finest known examples of American Colonial architecture and decoration. These precedents were followed with unusual care, accuracy and good taste. Considering the great American after whom the hotel is named, no more appropriate style of architectural decoration could have been

Photos. Drix Duryea

The Oval Palm Room Is Designed in the Adam Style, Carried Out in Tones of Green, Blue and Old Rose

chosen, for the Roosevelt ancestry is closely identified with the history of this country from the days of the earliest Dutch settlers.

Among the early American buildings from which inspiration was derived for the design of the interior details of The Roosevelt, are the New York City Hall; "Homewood," the famous Baltimore home of the Carrolls, built in 1809; "Whitehall," a famous Colonial mansion of the 18th century; the "Octagon" built in 1810 in Washington; "Kenmore," an old Virginia mansion, built about 1753; the Gordon house in Savannah, built about 1800, and the well known Gibbs house in Charleston, built in 1753. Space does not permit a detailed account of each individual use of precedents from these various Colonial buildings. Only a general description of the interior architecture and decoration of the various rooms will be attempted. Entering the main lounge by the stairway from the entrance vestibule on 45th Street, an impression of unusual dignity and refinement is obtained from the tall, fluted Corinthian pilasters and coffered ceiling of the main lounge. The walls, pilasters and cornice are of travertine, while the plaster ceiling is painted in old ivory and dull gold. Rugs in soft tones of blue and old gold, as well as the rich brocades and velvets used for the furniture coverings, add warmth and richness to the color effect of this great room. The iron balustrades which are copied from those of an

View of Main Lobby, Looking Toward Palm Room

A Monumental Stairway Leads from the Entrance Vestibule to the Main Lobby

HOMELIKE ATMOSPHERE OF BREAKFAST ROOM IS PROCURED THROUGH USE OF A LANDSCAPE PAPER

Photos. Drix Duryea

GRILL ROOM ON THE GROUND FLOOR HAS A LOW BALCONY ON ALL SIDES

THE ROOSEVELT HOTEL, NEW YORK

GEORGE B. POST & SONS, ARCHITECTS

VIEW OF MAIN DINING ROOM, SHOWING MURAL PANELS BY N. C. WYETH

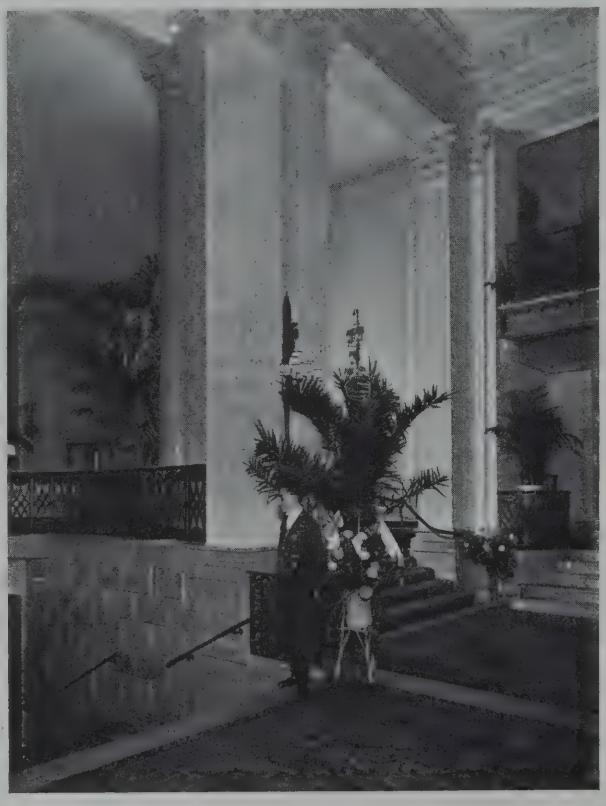
ONE END OF THE LONG LOUNGE OVERLOOKING MADISON AVENUE

THE ROOSEVELT HOTEL, NEW YORK

GEORGE B. POST & SONS, ARCHITECTS

PUBLIC LIBRARY

old house on Irving Place, New York, add notes of interest to the various openings between the grouped pilasters. The main lobby is separated from the Palm Room at the south by pilasters and flights of low steps at either side. Treating the Palm Room as a continuation of the main lobby adds still further to the dignity and spaciousness of this room. The so-called Palm Room, which really serves as a foyer and reception room for the main dining room, is elliptical in shape and decorated in the Adam style with marbleized columns and painted wall decorations in pleasing shades of soft green. The wall decorations themselves suggest Chinese Chippendale influence. The beautiful carpet in soft tones of green, yellow and rose has also been designed in the Adam style. Painted and upholstered chairs and sofas are attractively arranged in groups with tables and lamps to form many centers for conversation and conference. The heavy hangings at the windows are of a rich yellow damask which contrasts delightfully with the gray-green of the walls and columns. Touches of dull gilt in the capitals of the columns, the mirror frames, chandelier and wall brackets, add still further to the effective color scheme of this richly satisfying room.



Detail of the Main Lobby

A few broad steps lead from the Palm Room into the main dining room, at the eastern end of which a low balcony with marble balustrade adds dignity and interest. The architectural details of this room are pure Colonial, the inspiration for which was largely derived from the decorative detail of the New York City Hall. The whole effect is one of monumental dignity and reserve. The paneled walls, the fluted pilasters, richly decorated entablature, and high arched windows hung with heavy draperies, reproduce with remarkable accuracy the atmosphere of a great Colonial banquet hall. On the north wall of this room a painting in three panels by N. C. Wyeth recalls the discovery by Hendrik Hudson in his ship, the "Half Moon," of the river which now bears his name, forming a pleasant note of color and interest on a long wall which otherwise would have been monotonous. The ivory white of the woodwork and ceiling in this room is relieved by the rich coloring of the window hangings, floor coverings and other furnishings.

A few steps above the main lobby level, along the Madison Avenue side, is the long lounge, a gallery which embodies a homelike atmosphere always welcome in hotel public rooms. The walls are paneled in oak, divided by pilasters after a design found in a paneled room in an old Colonial house in Coventry, Connecticut. In this paneling, which represents the earliest phase of English Renaissance architecture in this country, there is a decided suggestion of the William and Mary period of English decoration; so with perfect consistency this long gallery or lounge has been furnished with replicas of old pieces of the William and Mary and Queen Anne styles. Chimney-pieces at either end of this long room make appropriate centers for the grouping of comfortable chairs and couches.

The two breakfast rooms on the northeast corner of the main floor have also been carried out in an attractive decorative scheme, through the combination of colored landscape wall paper and Colonial woodwork finished in white. The fireplace in this room, which contains an over-mantel decoration by Mr. Wyeth, is an unusually fine example of the Colonial period, old Dutch tile forming the face of the fireplace opening. One flight above this main floor is the Colonial ballroom with its colorful wall panels by Alfred Crisp, representing the story of Cinderella. The tall windows of this well proportioned room were inspired by those of the Chase house, built in Annapolis in 1770, while the design of the cornice is taken from the old Brewster house built in Charleston in 1760. The ironwork of the elaborate balcony railing, decorated in dull gold and silver, is taken directly from a design by Robert Adam, and the Colonial detail of the ceiling is derived from "Kenmore," an old Virginia mansion. The warm tones of ivory and old gold give a richness to the splendid architectural details.

The consistent use of Colonial details and decorations throughout both the public and private rooms of The Roosevelt produces a consistency of decorative design seldom found in the modern hotels.

House of J. G. Kellogg, Esq., Winnetka, Ill.

CHATTEN & HAMMOND, Architects

IN wide acreage overlooking the Skokie Valley is located the Italian villa of Mr. J. G. Kellogg. To take advantage of the extensive view from the site selected, the house was carefully located. Besides the main house there is the large building which contains a four-car garage, apartments above for chauffeurs, and stable and wagon storage, shown on page 288. There is also a small gate lodge at the entrance to the estate.

The residence itself is set back from the main road far enough to permit the grouping of all the buildings upon a curved drive in a manner which adds greatly to the interest and effectiveness of the entire composition. All of the buildings are constructed of hollow tile finished on the outside with cement plaster of a rough, uneven texture and of a color to harmonize with the roofs, which are of mottled Spanish tile in soft tones of dark red and brown. The trimmings are in buff Indiana limestone, with a few details executed in polychrome terra cotta. The interior walls of the main portion of the house are of plaster, sponge finished, painted and glazed. Floors throughout the first story, except in the library and service portion, are of tile. In the living room a dark brown tile has been used, and the wood wainscot is finished in brown with mouldings brought out in dull blue and gold. The tile floor in the hall is gray and black faience, while in the studio tile of blue and black are used. The wainscots of all bathrooms are of colored tile in mat finish. The special feature of the house is the studio, which has been built to provide a place of greater privacy and seclusion for the family. A loggia and broad terrace open off this room, from which an extended view over the Skokie Valley may be enjoyed. The walls of this studio are tinted to contrast with the dark ceiling of redwood. From this room a private stairway leads to the master's suite on the second floor, the stairs occupying a corner tower.

The service wing has been planned to give ample cross ventilation to all the rooms. A large laundry and servants' dining room, having windows on three sides, occupy the end of the service wing. Above the service rooms on the first floor are the servants' bedrooms and bath, which are reached by a small stairway from the passage leading to the laundry.

In design the exterior of the house follows closely Italian prototypes found in the smaller villas around Florence. The rough, stucco-covered walls, tinted in tones of dull yellow, rise two stories to the low

First Floor Plan

Second Floor Plan

The Living Room

The Studio

pitched roof of brown tile. Iron balustrades and grilles, in addition to the stone decorations of the entrance arcade, further emphasize the Italian spirit of the house. The exterior design, although unsymmetrical, is well balanced. The large studio wing at the north end of the house is balanced by the long service wing at the south. The small arched windows of the studio with their heavy iron grilles give a mediæval touch to the high plaster walls of the studio wing. Approaching the entrance side of the house, a low stair tower is discernible above the flat roof of the studio. This stair tower, with its arched windows and pyramidal tile roof, still further adds to the Florentine appearance of this villa. The garden front shows less formality of design than the entrance facade. Here the long terraces of the living room and the studio loggia effectively add to the composition, which is well studied as regards picturesque balance. The square stair tower fits pleasantly into the composition in the angle formed by the studio and main house. The vertical lines of the tower are offset by the horizontal lines of the studio and loggia roofs. This composition of tower, low loggia and the projecting two-story bay of the library is balanced by the length of the main house extending to the south and the large breakfast

Entrance Front, House of J. G. Kellogg, Esq., Winnetka, Ill.
Chatten & Hammond, Architects

Entry to Studio

The Studio

porch off the dining room. The composition is still further continued to the south by the service wing of the house and the picturesque garage and stable buildings beyond. Although not close in its adherence to Italian precedent, the design as a whole suggests a pleasant compromise between modern requirements and ancient precedents. A certain freedom in the handling of all details gives a distinctly American feeling to this Italian villa design.

The plans show a well studied arrangement of living rooms and halls. Entering through a large arcaded loggia, a view is obtained out over the west terrace, through the doors of the living room, which are on axis with the front door. The main hall runs the long way of the house, having a graceful circular stairway opening midway of its length. The principal room in the main house is the living room, 21 by 32 feet. This room opens onto a broad flagged terrace overlooking the lawn and distant valley on the west. To the south of the living room is the square dining room with its curved alcove bay, while to the north is the library with high bookcases and deep bay windows. At the north end of the entrance hall the studio is entered through a passageway which is paneled from the tile floor to low, vaulted ceiling, as may be seen in the illustration on page

Main Hall, House of J. G. Kellogg, Esq., Winnetka, Ill.

Chatten & Hammond, Architects

287. The studio, which is 20 by 30 feet, practically the same dimensions as the living room, by reason of the added height of the ceiling with its exposed beams is given an appearance of greater size than the low ceiled living room. Rough plaster walls with tile base are used throughout the first floor of the house. These walls give severity and dignity to the decorative effect of the interior, which is relieved by the use of antique Italian and Spanish furniture, candelabra, and mirrors. Color in the various rooms is obtained entirely by the use of rich toned tiles for the floors and interesting brocades and linens for the window hangings and furniture coverings. The fireplace in the living room is decorated with a richly carved enframement of mouldings, while the chimneypiece in the studio is carried out in severe interpretation of the Italian style. A balustraded balcony in dark redwood adds interest to the left wall of the studio, connecting with the landing of the circular stairway in the tower, leading from the studio up to the master's suite on the second floor.

The square dining room, which is located at the northwest corner of the house, opens into the living room and connects by a square entry with the main hall. Directly back of this room is the large serving pantry, which has two openings into the kitchen. One of these openings is through a pan closet, which is rather an innovation, connecting with the butler's pantry. The large kitchen has outside ventilation on opposite sides, as it extends the entire width of the wing of the house. Ample storage, refrigeration and pantry spaces have been provided. The plan of the entire service department shows care and thought in the manner in which it has been worked out for the comfort and convenience of all.

The plan of the second floor of the main house, which in outline exactly duplicates the lower floor, contains six master bedrooms, a large sitting room, dressing room and four bathrooms. Two of the latter are located so as to be accessible from two bedrooms each. The height of the studio ceiling prevents the locating of any rooms above it. The sitting room in the master's suite, situated in the center of the house without windows, is lighted by an elliptical ceiling light which gives this room the quaint effect of a salon on a private yacht. The bedrooms of the second floor, like the living room on the first floor, are all finished in rough plaster and furnished with antique Italian, Spanish and French furniture. A pleasing consistency has thus been achieved in the interior as well as the exterior of the Kellogg house.

This same consistency in design is found in the farmer's house and the large garage and stable building, where stucco walls and low roofs of red and brown tile repeat the materials and treatment of the main house. These two service buildings have been wisely located on the arc of a circle formed by the entrance drive, intruding in no way upon the formality of the entrance courtyard, so that approaching the house the eye is led pleasantly to the long, low Italian villa lines of the house itself, which remains the dominant feature of the group. The low roofs and projecting wings of the garage and stable building are repeated in the farmer's house with which it is connected by high, stucco-covered walls.

Garage and Stable. Estate of J. G. Kellogg, Esq., Winnetka, Ill.
Chatten & Hammond, Architects

"Little Orchard"

HOUSE OF MRS. LAURA LEVERING, GREENWICH, CONN.

PHELPS BARNUM, Architect

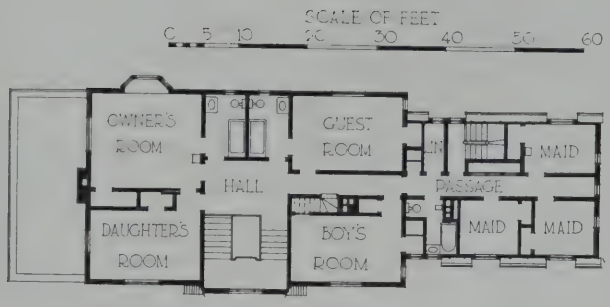
DESIGNED in a simple adaptation of the English farmhouse style, this stucco house owes its charm to carefully studied proportion and informal balance of design. The stucco is tinted soft ocher and the trim stained brown. Gay orange awnings edged with blue add color to the design during the summer months. During May, when the house was photographed, the pink and white blossoms of the old apple trees in the midst of which the house is located stood out in pleasing contrast to the warm tones of the stucco walls. The roof of the house is stained in tones of brown, copper and dull green, sufficiently deep in tone to hold down the lighter tone of the walls. Deep yellow chimney pots on the tops of the stucco-covered chimneys give the final touch of color to the entire design, expressing and emphasizing its character.

The lot on which this house is located is not large, but the house has been so well placed that a feeling of complete isolation and privacy is obtained from the garden front of the house, where a paved terrace as well as a small covered porch gives ample opportunity for out of door life during the summer months. On this garden front tall casement windows help to connect more intimately the living rooms of the house with the terrace and flower garden adjoining. An oriel window roofed with copper gives a note of interest and picturesqueness to the otherwise formal garden facade of the house.

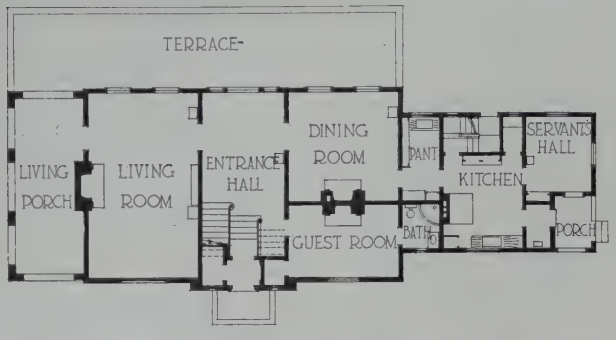
The plan is as simple and direct as is the exterior design. From the entrance door a small vestibule is entered, off of which is a good sized coat closet. From this tile-floored vestibule two steps of travertine lead up to the floor of the main entrance hall. A wrought iron handrail guards the steps on one side, while the start of the main stairway, which rises over the entrance door by means of a long landing, protects it on the other side. The wrought iron handrail and newel of this stairway are exceedingly interesting in design and execution. Heather brown tile of varying tones form the floor of this hall, adding a warmth of tone which contrasts pleasantly with the soft buff of the rough plaster walls and the dull brown stain of the cypress doors and trim. Hangings of Italian damask in red add a further cheerful note to this inviting entrance hall. Opposite the front door in this hall is a wide triple window with casements which gives a delightful vista out across the flagged terrace to the rising hillside back of the house, dotted with picturesque and

Photos. Kenneth Clark

The Entrance Front Shows a Simple Adaptation of English Cottage Architecture



Second Floor Plan



First Floor Plan

fantastic shaped apple trees, under which the terraced flower garden climbs the hill back of the house.

The living room on the left of the entrance hall occupies the entire western end of the house, permitting windows and tall casements on three exposures. At the north end of this room two casement windows open out onto the stone terrace, while at the west another opens onto the covered porch which is glazed in during the winter months to form a sun porch. The rough plaster walls, trim and doors of this living room are painted a delightful shade of warm gray-green. The large rug, which almost entirely covers the dark stained oak floor, is of a deep mulberry color, while the long window draperies, which are always drawn together at night, are of an unusual shade of soft yellow. This color scheme of mulberry, yellow and green is repeated again in the English chintz which covers many pieces of the furniture in this room. The facing and hearth of the fireplace are of Verd Antique marble in a deep shade, and on the shallow mantel shelf above the fireplace two vases of Chinese red add an interesting note of color against the green of the wall. A more delightful combination of colors than are combined so successfully and

The Garden Front Has a Paved Terrace Upon Which Open the Windows of Living and Dining Rooms

pleasantly in this room could hardly be imagined. Arched doorways containing solid, paneled doors lead from the entrance hall into the dining room as well as the living room, these doors, when opened, permitting an uninterrupted view from the covered porch adjacent to the living room, into the house, across the living room and hall into the dining room, where an old Italian mirror hangs on the inner wall. This axial vista is one of the charming features of the house.

The decorative scheme in the dining room is quite as unusual and delightful as is that of the living room. Illustrations unfortunately convey no idea of the color which makes these rooms so appealing. In the dining room the walls are painted an unusual shade of blue, in which, through a yellow glazing applied on top of the last coat of paint, interesting texture and warmth of tone have been obtained. Blue is generally considered a cold color, but when treated with a warm glaze it takes on a remarkable warmth of tone. Against the blue walls of the dining room an old Coromandel Chinese screen in red lacquer with designs in black, as well as two old cabinets of red lacquer made in England during the Chippendale period when the Chinese style enjoyed

Corner of the Principal Bedroom

Homelike Atmosphere Is Attained in the Living Room by the Grouping of the Furniture

temporary popularity, gives delightful notes of color against the blue walls. Otherwise, the furnishings of this room are old pieces of French walnut of the Louis XIV period. Above the heavy bolection moulding of black and gold marble which surrounds the fireplace opening an interesting architectural decorative painting adds interest to the design. Over the dark stained oak floor the Chinese rug in tones of brown and blue ties together the decorative scheme of this interesting room.

On the right of the entrance hall, back of the dining room, is a small study in the Colonial style with old fashioned buff wallpaper and trim and woodwork painted to match. A large triple casement window floods this room with sunshine during the day, and the open fireplace permits the cheerfulness of burning logs at night. Above the Colonial mantelpiece is a very unusual mirror in gold and cream of the Empire period. Opening off the study is another good sized coat closet and a lavatory. This room is furnished in Colonial mahogany. Window draperies of blue still further emphasize the Colonial color scheme of blue and buff, as does also the blue toned rug which covers the floor. The colored English mezzotints in black glass mats and black frames supply an interesting note of contrast against the buff wallpaper, reproduced from an old house in Portland, Maine.

A Chinese Screen Conceals the Door from Dining Room to Pantry

The principal bedroom, a corner of which is shown on page 291, is decorated in tones of apricot and green. The walls are covered with a soft apricot wallpaper, the color of which is exactly matched in the woodwork and doors. The flounced window draperies are in apple green, as are also the coverings of the window seat and bed. The *chaise longue* and easy chairs are upholstered in an English printed linen which repeats the green and apricot colors of the room. The rug which covers the floor is of a deep taupe. Another bedroom is decorated in yellow and green with touches of blue. Here a Chinese paper of yellow ground with small landscapes in green and blue forms an interesting wall covering. The woodwork and doors in this room are painted the same shade of yellow as the wallpaper. The casement windows which look out into the garden and orchard behind the house are draped with hangings of bluish-green, repeating the blue-green decorations in the wallpaper. To carry out the Chinese spirit of this room the furnishings are in mahogany of the Chinese Chippendale period, and covering the floor is a Chinese rug in tones of blue-green and yellow. On account of the gaiety of the patterned wallpaper all pictures have been wisely omitted from this room. A third bedroom is decorated in gray and blue relieved by touches of old rose found in the color of the rug and the flowers in the old English glazed chintz. This room, which is Colonial in style, is furnished with interesting pieces of Sheraton and Hepplewhite furniture. The walls are hung with paper in a single tone of warm ash-gray, with woodwork and doors painted to correspond. Against these gray walls the window hangings and bed covers of French blue are very effective, while in the coverings of the upholstered furniture the glazed chintz shows a flower design in old rose and blue against a gray background, repeating the color scheme of the room. The fourth bedroom shows another combination of grays and blues, this time relieved by a rich shade of yellow. The walls are hung with paper of a robin's egg blue, with the woodwork painted to match. The rug is deep gray in color, and the window hangings and bed covers are of flowered printed linen in which rich tones of yellow predominate. The stair hall on this floor continues the color scheme of buff and dull red used in the main entrance hall below.

In the construction of this house a wood frame covered with wire lathing was used as a ground for the exterior stucco, making it possible to secure an attractive and livable house at a moderate cost. The floors, with the exception of those in the entrance hall and bathrooms, which are of tile, are all of quartered white oak. Cement wainscoting, lined off to imitate tile, is used on the walls of the bathrooms. The high pitch of the roof makes possible the future addition of other master bedrooms and baths on the third floor, if such should be desired, but the roof is much more effective as it is, unbroken by dormer windows. In fact, much of the picturesque and pleasing quality of this house is due to the unbroken surfaces of the roof, against which the gabled roof of the low projecting entrance porch gives a note of scale to the entire exterior design.

A Renaissance Garden at San Domenico, Florence

By ROGER WEARNE RAMSDELL and HAROLD DONALDSON EBERLEIN

THE great Italian gardens of the Renaissance and of the succeeding Baroque age were not always the finished creations of marvelous beauty and compelling charm that we see today. There was a time in the history of nearly every one of them when they were as naked and harsh in their newness as the still uncompleted Victor Emmanuel Monument in Rome. It could not well be otherwise. Gardens, either great or small, do not come suddenly into being endued with all the grace of mellow, subtle maturity, fully grown, like Minerva springing from the head of Jove. This is a truth that many concerned with the making of gardens, especially a certain type of clients, possessed of enthusiasm and abundant means but with little philosophic patience, are too likely to overlook.

The great garden makers of the past had faith and vision; we have the ripe enjoyment of what their faith and vision created, and for this fullness of pleasure we owe a debt of gratitude to the garden makers who planned and labored centuries before we were born. To enter the garden of the Villa d'Este ought to be enough to inspire in us a lively sense of personal obligation to Cardinal Ippolito d'Este and Pierre Ligorio. And familiarity with the garden can only increase our reverence for the Cardinal and Ligorio if we regard a picture of the place painted just after its completion. It is a curious picture, showing with brutal and meticulous frankness every detail of the scheme. There is visible none of the grace or glamor resulting from more than three centuries of growth. The planting, in its naked, scrubby scantiness and puny size, creates the impression of a well ordered vegetable patch in its incipient stages. To have embarked on a work of such magnitude with so little apparent justification or prospect of immediate enjoyment called for the exercise of faith, vision and patience in no mean degree. In the making of any garden—that is, of any garden in which coherent plan plays a part—faith, certitude of vision, and patience are indispensable, but in smaller gardens, of intimate and unpretentious character, a measurable reward of these qualities is realized in a vastly shorter time than is necessary for the mellowing of a great scheme. This was true in the Renaissance, and it is true now, and always will be.

The little *cinquecento* garden at San Domenico, of which the plan and illustrations are given here, is an admirable example of the sort of place in which the Renaissance garden makers found an opportunity for securing effective results in the briefest possible space of time. What they did then is just as readily achievable by us now. As the garden scheme of this unassuming little villa is virtually unchanged from what it was in its pristine condition, the place is an illuminating, tangible document and replete with suggestions of value for modern use.

The only parts of the establishment with which we are concerned are the loggia along the south front of the house and the approximately square garden with its traditional quadripartite division. On the north the garden is bounded by the aforesaid loggia, the house back of it, and the tool house; on the east and south it is bounded by high stone walls covered with stucco, and on the west it is shut in by the lemon house. The mere fact of there being total enclosure about a space of regular shape assures some degree of coherent plan at the outset; the traditional four-part division with axial paths, boundary paths, and raised beds along the boundaries completes an arrangement simple, obvious and satisfying. The garden is formal to the extent of possessing definite form and symmetrical relation between its parts; it is not formal in the sense of being stilted or pretentious—a connotation which many, unfortunately, attach to the term. As a matter of fact, it is exceedingly intimate and spontaneous in quality. Furthermore, the arrangement, —a very common one indeed,—is indicative of hard common sense on the part of the old garden makers who were fully aware that out of a limited area far more effective and pleasing results could be obtained by well ordered method than by any amount of whimsical or even ingenious affectation of naturalistic savagery—that grotesque fallacy into which "Capability Brown" and his followers were destined to fall several centuries later, to the utter undoing and destruction of some of the finest old gardens in England, Italy and France. It should be noted that flowers are not contemplated in the structural scheme of this garden. They are incidents, and highly agreeable and desirable incidents, but the garden is so devised that it has just as much coherence and poise without them as with them. This is a thing worth remembering today when gardening has not yet wholly escaped from the absolute floricultural thralldom of the last century.

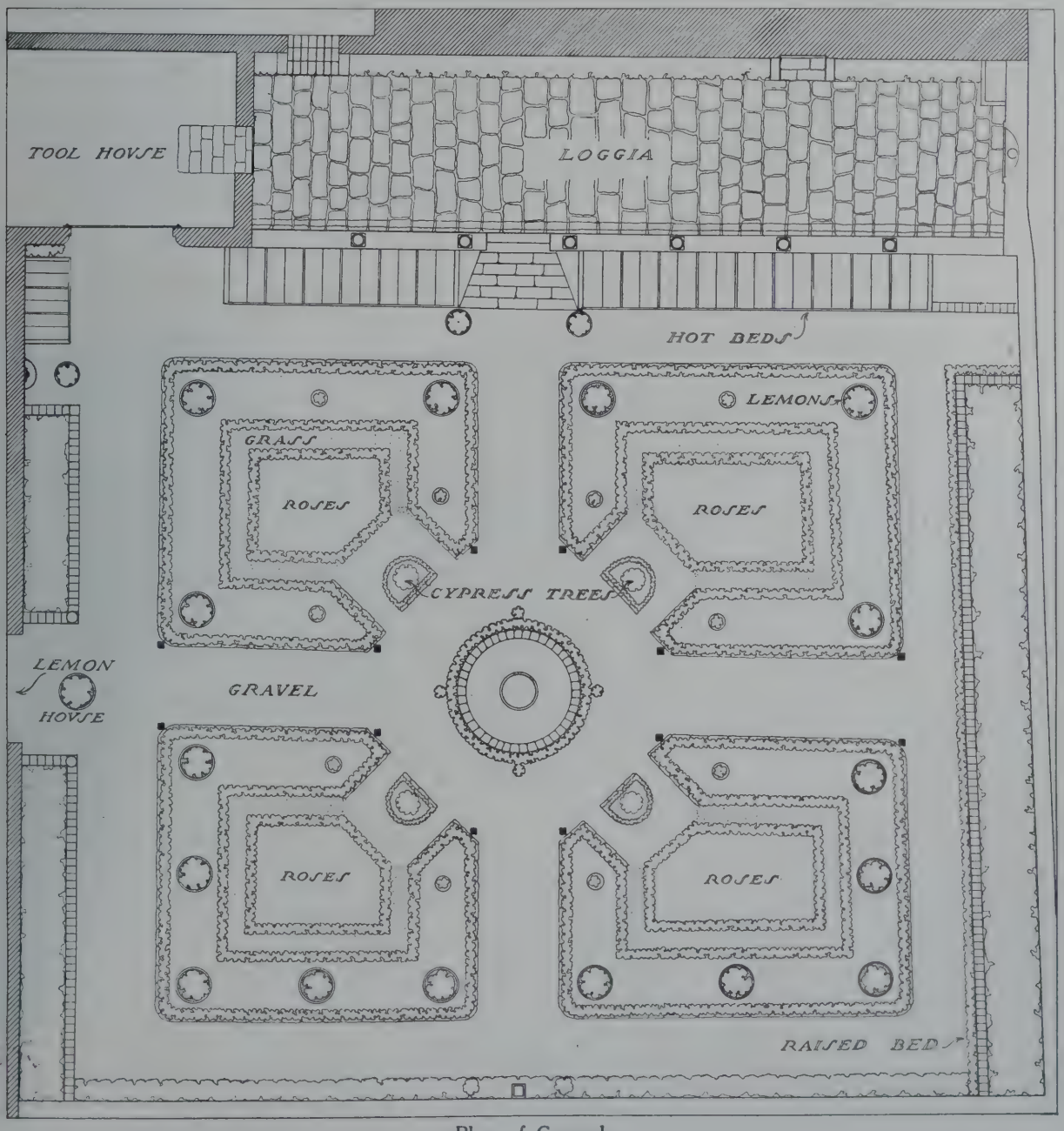
The chief divisions, the central pool and the walks, are edged with low growing box. In the center of the garden, and indicated by square black dots on the plan, are stone piers at each end of the path. Arched iron bars from one to the other form rose trellises, and the rose vines are festooned from these points to the loggia. The loggia is not roofed, but an iron framework (replacing the ancient pole equipment), resting upon the columns and sloping upward to the house wall, gives support to a heavy growth of wistaria that forms a complete shelter. The wrought iron gate leading from the loggia into the tool house, which is shown together with the early eighteenth century or *Barrochino* wooden

DETAIL OF A CORNER OF THE GARDEN AT SAN DOMENICO, FLORENCE

BOSTON PUBLIC LIBRARY

gates set in the doorway between the tool house and the garden on the detail sheet of measured drawings on page 296, is very free and original in design, suggesting Spanish ironwork of this period. The field of the design shows the use of scrolls bound together and grouped in such a way as to produce a symmetrical pattern, which is further emphasized by vertical and horizontal axes, culminating in large center rosettes and hand-pressed sheet iron. The border again shows symmetry in the use of corner rosettes and scrolls which break the four sides of the axial points. The whole effect of the design is refined and unusually decorative. In the stone entablature of the doorway, in which this gate is placed, there is found a corresponding delicacy of handling in the fine mouldings and small brackets.

Of equal interest and originality in design are the wooden gates in the doorway of the tool house. The design of this double gate is more formal in character than the wrought iron gate in the loggia; in fact, it differs so greatly in character that it was undoubtedly the work of a different craftsman. The field is occupied by straight balusters of wood, with heavy center stiles dividing each gate into two parts. At the bottom of the design a flowing scroll is carved in the base of the gate, while oval-shaped scrolls terminate each of the balusters, forming a continuous decoration at the top, as well as the bottom of the gates. In the field of plain balusters, graceful scrolls freely handled interrupt and relieve the simplicity of treatment. A delicate cresting with fleur de lis finials decorates the top of the gates.



Plan of Grounds

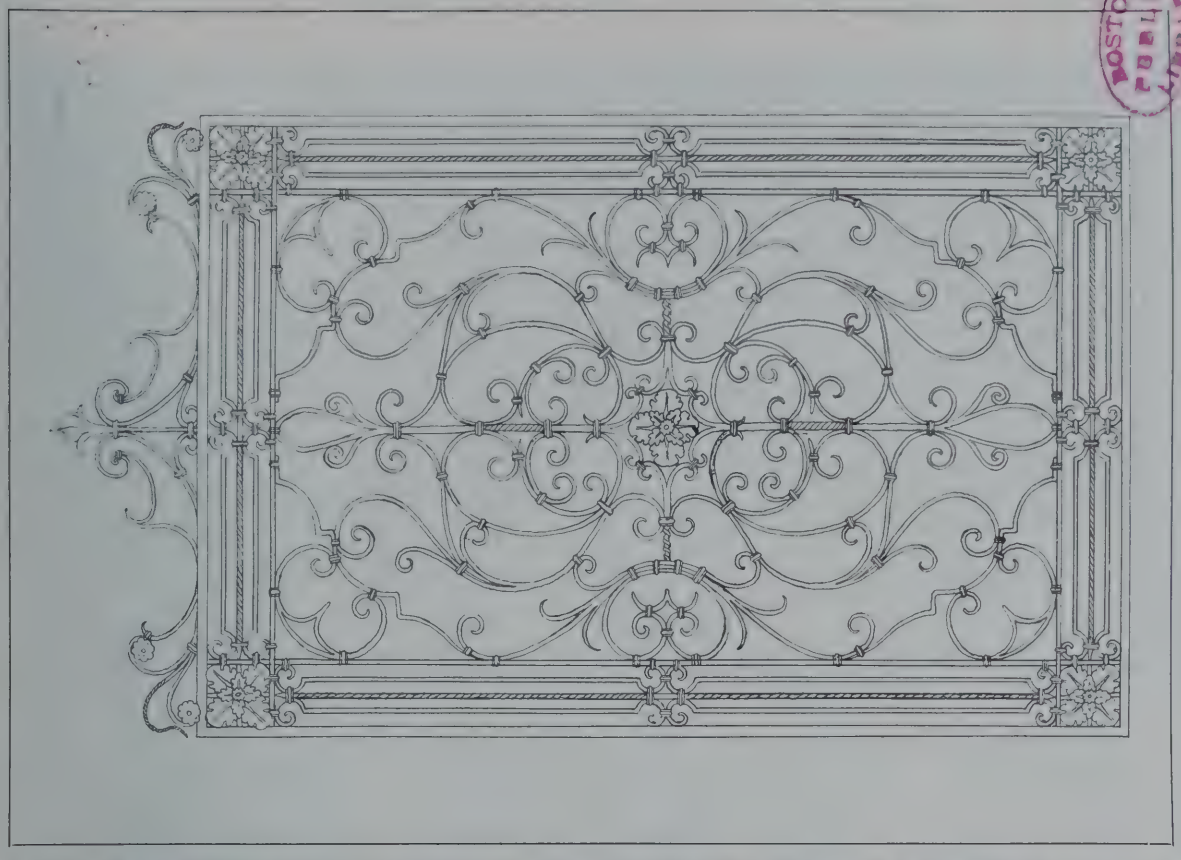
WOODEN GATES TO THE TOOL HOUSE

SCALE DETAIL OF THE WOODEN GATES

OLD RENAISSANCE GARDEN AT SAN DOMENICO, FLORENCE

BOS PUB LIBRA

BOSTON PUBLIC LIBRARY



SCALE DETAIL OF IRON GATE FROM THE LOGGIA

WROUGHT IRON GATE FROM THE LOGGIA INTO THE TOOL HOUSE

OLD RENAISSANCE GARDEN AT SAN DOMENICO, FLORENCE

THE STONE-PAVED, VINE-COVERED LOGGIA AT SAN DOMENICO, FLORENCE

STON
BLIC
BRARY

ENTRANCE DOOR TO THE LOGGIA AND GARDEN AT SAN DOMENICO, FLORENCE

ON LIC LIBRARY

Attention should be called to the interesting treatment of the stucco walls of the house itself. The surface has been broken up into geometrical panels by the use of stucco of different colors. This wall treatment, which is found in many of the villas of northern Italy, is an attractive and delightful way of relieving the monotony of broad, unbroken surfaces of stucco. The illustration on page 299 shows the use of these decorative panels. In this same illustration attention should be called to the unusual wrought iron hinges and lock plates, the boldness and the fantastic detail of which is characteristic of the late Baroque style.

The illustration, on page 294, of the corner of the garden formed by the tool house and the main building shows part of the wooden gateway of the tool house, as well as the beautiful wrought iron grille of the semi-circular arched window of the main house. The brick arch of this window is broken by a keyblock delicately carved. This touch of decoration is repeated below the window in the curious mask carved out of one of the foundation stones of the house to form a small fountain. This same illustration gives an excellent idea of the informal and picturesque quality of this old garden, in which hotbeds and potted trees break the regularity of the design. The cypress trees themselves give added interest in their irregularity of outline.

The charm of this old villa may be still further appreciated by the impression obtained from the illustration on page 298, in which the brilliant sunlight filtering through the dense foliage of the thickly massed vines of the loggia, flecking the rough flagstone floor with spots of light, truly portrays the atmosphere of the old Italy. The feeling of homelike informality and livableness of this compact little garden adds greatly to its charm. In plan it offers many suggestions which could be utilized effectively and successfully in a small modern garden. The uniformity and simplicity of the design, enclosed as it is within a nearly perfect square, is unusually practical. One purpose in publishing the plan and photographs of this delightful little garden at San Domenico is to present a design fundamentally adapted in size and character for use in American country homes being built today in the Italian style.

General View of the Garden at San Domenico, Florence

ENGINEERING DEPARTMENT

Charles A. Whittemore, *Associate Editor*

The Design of a Truss with Parallel Chords

By CHARLES L. SHEDD, C.E.

FROM some points of view, the truss is the structure which should be first studied by the student. Its use involves the fundamental principles determining the distribution of stresses in such a way that they appear more simple than in the case of the internal stresses of a beam or girder.

The most important principle of the distribution of stresses is that if we take any structure as a whole or if we cut out any portion of it, then the forces acting on such portion must always fulfill three conditions: First, the algebraic sum of all the vertical forces must equal zero. Second, the algebraic sum of all the horizontal forces must equal zero. Third, the algebraic sum of all of the moments about any point must equal zero. If any of these conditions were not fulfilled, then the structure would not be in equilibrium; if the first were not true, then the structure would be moving in a vertical direction; if the second were not true, it would be moving in a horizontal direction; if the third were not true, it would be rotating. When we speak of horizontal and vertical forces we may not actually mean that, but rather we speak of all of the forces acting in a plane after they have been resolved into horizontal and vertical components. That is, we speak of these components. Furthermore, it may be convenient to consider these components as not acting at right angles to each other but in any two directions not parallel to each other. This principle is often regarded by the student as so simple that it would be absurd to think of a person's not knowing it, but as a matter of fact it is neglected every day by engineers of long experience who understand its truth perfectly but who do not see its application to the problems before them. No problem in engineering should be attempted without bearing these three conditions constantly in mind.

In a truss we can see the direction which all of the interior forces take, and we can apply these three principles to different parts of it, dividing the truss into as many parts as we find convenient for the application of these principles. Fig. 1 shows a truss with parallel chords with the loads applied to it, also the graphical solution of the stresses in the various members. The truss has its top and bottom chords parallel and is composed of ten panels each 8 feet long. The depth of the truss is also 8 feet. The diagonal web members slope downward toward the center of the truss and are in tension. This is the usual arrangement for a steel truss, as it is more economical to have the longer web members in tension, while in a wooden truss the diagonals are reversed as the truss is more easily constructed to have the verticals in tension. A truss such as is shown in Fig. 1 is known as the "Pratt truss."

The stress diagram is constructed in this manner. The spaces between the loads and between the various members are first lettered. The author uses capitals between the exterior forces and small letters between the various members. The loads are

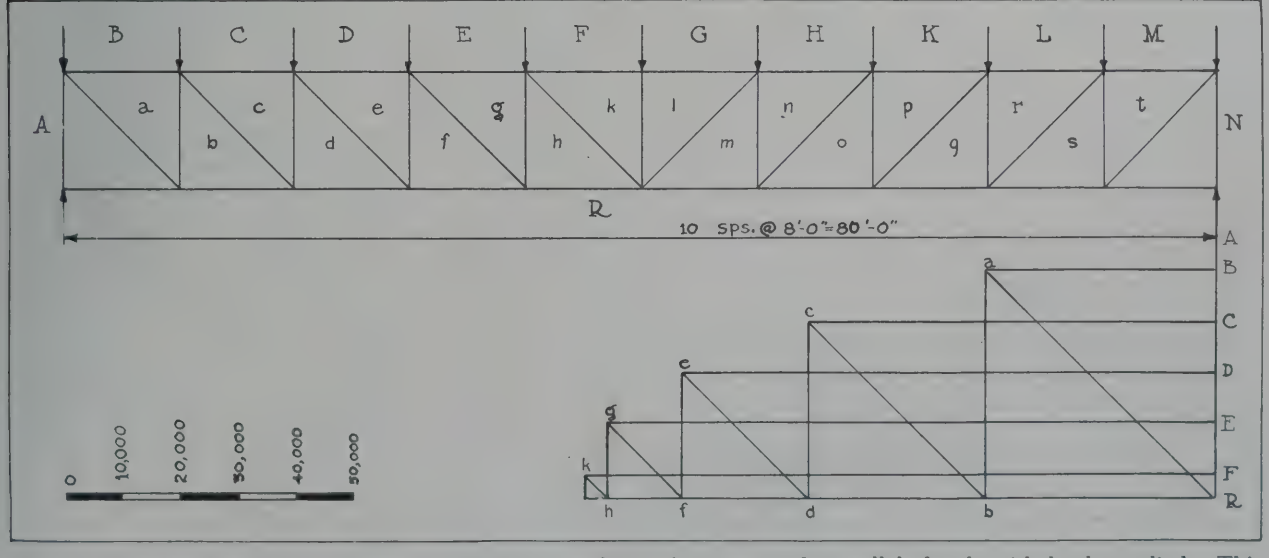


Fig. 1.—Graphical solution of stresses in various members of a truss with parallel chords with loads applied. This 10-panel truss is here taken as carrying a roof with wooden construction where the live load is 40 pounds per square foot and the dead load 30 pounds per square foot. Conditions and details of graphic solution will be found here

Mem	Stress	T/C	Length	Section	Riv
Ba	40,3	C	8	2–6″×3½″×⅜″ L^s	6
				or	
Cc	71,5	C	8	2–5″×4″×⅜″ L^s	10
De	94,0	C	8		13
Eg	107,4	C	8	2–6″×4″×½″ L^s	15
Fk	111,9	C	8		15
Rb	40,3	T		2–5″×3½″×⅜″ L^s	6
Rd	71,5	T			10
Rf	94,0	T		2–6″×4″×$\frac{7}{16}$″ L^s	13
Rh	107,4	T			15
RA	44,8	C	8	2–4″×3″×$\frac{5}{16}$″ L^s	6
Ra	57,0	T		2–4″×3″×$\frac{5}{16}$″ L^s	8
ab	40,3	C	8	2–4″×3″×$\frac{5}{16}$″ L^s	6
bc	44,4	T		2–3½″×2½″×$\frac{5}{16}$″ L^s	6
cd	31,4	C	8	2–3½″×2½″×$\frac{5}{16}$″ L^s	5
de	31,6	T		2–2½″×2″×$\frac{5}{16}$″ L^s	5
ef	22,4	C	8	2–3″×2″×$\frac{5}{16}$″ L^s	3
fg	18,9	T		2–2½″×2″×$\frac{5}{16}$″ L^s	3
gh	13,4	C	8	2–3″×2″×$\frac{5}{16}$″ L^s	2
hk	6,4	T		2–2½″×2″×$\frac{5}{16}$″ L^s	2
kl	9,0	C	8	2–3″×2″×$\frac{5}{16}$″ L^s	2

¾″ ϕ rivets @ .7500 lb.
½″ gussets.

Fig. 2.—Arrangement of results of scaling stresses from the stress diagram and the design of the members themselves with the number of rivets required to take care of each stress

determined and also the reactions. If the loading were not symmetrical the reactions could be found in the same way as for a beam. (See THE FORUM for July, 1921.) The loads are laid out on a vertical line to some convenient scale, as shown in the stress diagram. Start with one force, such as the left-hand reaction, and take all of the exterior forces in order, passing around the truss in the direction taken by the hands of the clock. In this case only half of the forces are laid off, as the truss is symmetrical both in loading and in interior construction. The distance between the points R and A represents the amount of the reaction, the distance between A and B the load at the end of the truss, the distance between B and C the load at the next joint and so on. In the end panels there is no stress in the lower chord, and therefore there is no letter in the space directly above it, as this space is part of the R space. If all of the exterior forces were laid out, we would finally get back to the point R where we started, illustrating the principle that the algebraic sum of all the vertical forces must equal zero, as already described in this article.

If we apply this principle together with the second to each joint in turn, we may find all of the forces in the truss members. First take the end joint at the top of the truss. The forces acting on this joint are the reaction RA, the load AB, the stress in the top chord Ba, and the stress in the end diagonal aR. These must be in equilibrium. To show this graphically in our stress diagram we construct the line Ba parallel to the top chord of the truss and the diagonal from R parallel to the diagonal in the truss, and letter their point of intersection a. We can measure the distances on this stress diagram to the same scale we used in laying out the loads and find out how large these stresses are. In the same way we construct the rest of the stress diagram. To determine whether any stress is tension or compression, we may take a joint such as the second from the end in the lower chord and place the letters surrounding it in order reading around the joint in the direction of the movement of the hands of the clock, thus RbcdR. We can then read these same letters in the same order on the stress diagram, and the order we read them in shows the direction of the force toward or away from the joint. Toward the joint indicates compression, and away from the joint indicates tension. Thus bc on the stress diagram is upward toward the left or away from the joint we are considering; therefore the member is in tension.

The method usually taught for laying out the stress diagram is to lay out the lines for all of the members, and if it closes in the end that is assumed as proof that the work has been correct. This is the best way for an unsymmetrical truss or for one with unsymmetrical loading, but for a truss with symmetrical loads like that used here and which is the usual kind encountered, it is not always safe, for the writer has known the same error to be made on each side of the truss, when it will still close and the error remain undiscovered. It is therefore recommended that the diagram be checked analytically, as will be described later, for the sake of safety.

The truss used here is taken as carrying a roof with wooden construction where the live load is 40 pounds per square foot and the dead load 30 pounds per square foot, making the total 70. It is taken as being an intermediate truss with another truss on either side of it, the trusses spaced 16 feet apart. The load at each of the intermediate panel points will therefore be 8,960 as indicated in Fig. 3. The reaction will be five times this load or 44,800 pounds. If we figure the maximum moment on the truss and divide by the effective depth of 8 feet we shall obtain the stress in the top chord at the center. This operation is shown in Fig. 3, where the stress is found to be 112,500. By scaling the stress diagram we get 111,900 for this stress. The difference between the two is 600 or a little over one-half of 1 per cent, which is near enough to make no practical difference in the design of the truss, and is therefore satisfactory.

In Fig. 2 we show the arrangement of the results of scaling the stresses from the stress diagram and the design of the members themselves with the number of rivets required to take care of each stress.

We must now examine the table, from which we choose the section for the various members. In most trusses, that is in all those where the stresses are not too large, we use for the section of each member two angles with the gusset plates connecting the various members between them. In the table we have arranged the various sections from which we are to choose our design after the principle first shown in the July, 1921, FORUM for beams. That is, we have arranged the possible sections in the order of their gross weight or area, which is in the order of their cost. Therefore, if we start at the top of

any column and run down until we find a stress large enough, the section opposite that stress is the most economical to use. In the same way if all sizes are not available, the first one found which can be obtained and which is large enough is the most economical; also, if we are limited in width or in any other way, the first section which we find which satisfies all of the conditions which we have to meet is the most economical for the case for which we are designing. The table is designed for ¾" rivets, and the members having angles of unequal legs have the short legs out. This is usually the most economical. The gussets are assumed to be ⅜" thick. If they are thicker, our design is on the safe side if anything. The allowable stress used for compression members is determined by the most common formula: 16,000-70 1/r. The allowable stress on the tension members is the usual 16,000 pounds per square inch on the net section. In the first column are shown the various sections in the order already described. The table referred to in this paragraph is on pages 304 and 305. The next three columns are for the design of tension members, the heading for each column showing whether the area of one, two or three holes has been deducted for each angle. Usually the stress for the greatest number of holes shown in the table is that which should be used. In this table the 2½" x 2" x 5/16" L is the minimum size used. 2½" is the smallest leg in which a ¾" rivet should be used, but a 2" leg can be used for the other leg. 5/16" is the thinnest material used by the writer. Some designers use ¼" as a minimum. In legs 4" or less one rivet line only is used. When the outstanding leg is over 2", a small angle may be used fastened to this leg and riveted to the gusset to assist in transferring the stress. By using such angles two advantages are gained: the eccentricity of the rivets in relation to the center of gravity of the member is decreased, and the size of the gusset is decreased. Also, in large angles there are fewer rivets in a single row. This is desirable as the end rivets cannot get as much stress as those near the middle of the member, due to the slight stretch of the member between the rivets in a tension member or the compression in a compression member of a truss.

When such an angle is used the rivets in the outstanding leg should be staggered with those in the leg against the gusset, so that only one rivet need be deducted from the gross area of each angle. In 5", 6", or 7" legs two rivet lines are used. These are staggered with each other, but the line in the outstanding leg contains rivets opposite those in the other leg, so that two rivet holes must be deducted. If both legs are 5, 6, or 7 inches in width, two rivets are still deducted, there being in all four rivet lines, alternately staggered. In an 8" leg there are usually three rivet lines, that in the middle staggered with the other two. If the other leg is 3½", this line is made to contain rivets opposite the middle line in the 8" leg so that there are still two holes to be deducted. If the outstanding leg is 6" then it contains two rivet lines and three rivets must be deducted. If both legs are 8", then there are three rivet holes to be deducted. When the member is a top or bottom chord it is often inconvenient to use auxiliary angles, in which case fewer rivets need to be deducted; but due to these angles not being used, there is an eccentricity in the member which should be considered. Some designers have a rule of thumb for taking care of this eccentricity; some figure it while others neglect it. The last method cannot be excused except for small members, where it is known to increase the stress but a small per cent. In this article we will consider that auxiliary angles are used in all cases.

In Fig. 2 we have the member designated in the first column, while in the second column we have the stress which we have scaled from the stress diagram in thousands of pounds, that is the last two ciphers are omitted. The third column shows whether the member is in tension or compression. Some designers use + and —, but these are more

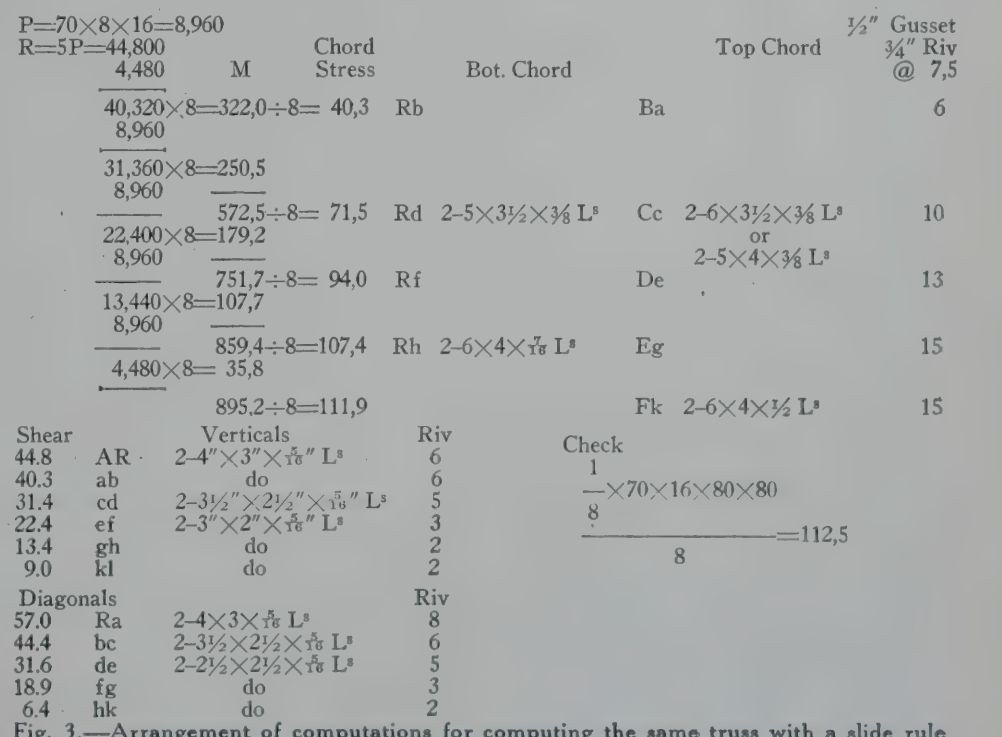


Fig. 3.—Arrangement of computations for computing the same truss with a slide rule

3/4 rivets
Short legs out

DOUBLE ANGLE TRUSS MEMBERS

3/8" b-b
fc = 16000 - 70 2/3

C.L. SHEDD

2 ls	Tension			Compression																				
	1h	2h	3h	L-6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
2½ x 2 x 5/16	32			25	22																			
2½ x 2½ x 5/16	38			28	24																			
3 x 2 x 5/16	38			30	27	24																		
2½ x 2 x 3/8	38			29	25																			
3 x 2½ x 5/16	42			34	32	29	26																	
2½ x 2½ x 3/8	44			32	28																			
3 x 2 x 3/8	44			36	33	29	26																	
2½ x 2 x 7/16	44			33	29																			
3½ x 2½ x 5/16	48			40	37	35	32	29	26															
3 x 3 x 5/16	48			37	34	31	28																	
3 x 2½ x 3/8	50			41	37	34	30																	
3½ x 3 x 5/16	52			44	41	38	35	32	29															
2½ x 2 x ½	50			37	32																			
2½ x 2½ x 7/16	52			36	32																			
3 x 2 x 7/16	52			42	38	34	31																	
3½ x 3½ x 5/16	58			47	44	40	37	34																
4 x 3 x 5/16	58			50	48	45	42	39	37	34														
3 x 3 x 3/8	56			44	40	36	32																	
3½ x 2½ x 3/8	56			48	44	41	38	35	31															
3 x 2½ x 7/16	60			46	42	38	34																	
2½ x 2½ x ½	58			41	36																			
3 x 2½ x ½	58			47	43	38	34																	
4 x 3½ x 5/16	63			53	50	47	44	41	38	35														
4½ x 3 x 5/16	63			53	50	47	44	41	38	35														
3½ x 3 x 3/8	62			52	48	45	41	38																
4 x 4 x 5/16	68			57	53	50	47	44	40	37														
5 x 3 x 5/16	68	58		57	54	50	47	44	40	37														
3 x 3 x 7/16	66			51	46	42	37																	
3½ x 2½ x 7/16	66			55	51	47	44	40																
3½ x 3½ x 3/8	68			56	52	48	44	40																
4 x 3 x 3/8	68			59	56	53	50	46	43	40														
3 x 2½ x ½	66			52	47	43	38																	
5 x 3½ x 5/16	72	64		64	61	58	55	52	49	46	43	40												
3½ x 3 x 7/16	72			60	55	51	47	43																
4 x 3½ x 3/8	75			63	60	56	53	49	45	42														
4½ x 3 x 3/8	75			64	60	56	53	49	46	42														
3 x 3 x ½	74			57	52	47	42																	
3½ x 2½ x ½	74			62	58	53	49	45																
3 x 2½ x 9/16	72			58	53	47	42																	
4 x 4 x 3/8	80			68	64	60	56	52	48	44														
5 x 3 x 3/8	80	70		68	64	60	56	52	49	45														
3½ x 3½ x 7/16	80			64	59	55	50	46																
4 x 3 x 7/16	80			69	65	61	57	53	49	46														
3½ x 3 x ½	82			68	63	58	53	49																
5 x 3½ x 3/8	86	76		77	73	70	66	62	59	55	52	48												
3 x 3 x 9/16	82			63	57	51																		
3½ x 2½ x 9/16	82			69	64	59	55	50																
4 x 3½ x 7/16	87			73	69	65	61	57	52	48														
4½ x 3 x 7/16	87	82		74	69	65	61	57	53	49														
5 x 4 x 3/8	93			82	79	76	72	69	65	62	58	55	52											
3½ x 3½ x ½	90			73	68	62	57	52																
4 x 3 x ½	90			78	73	69	65	60	56	52														
4 x 4 x 7/16	94	80		78	73	69	64	60	55	51														
5 x 3 x 7/16	94			79	75	70	66	61	57	52														
3½ x 3 x 9/16	90			75	70	64	59	54																
3 x 3 x 5/8	90			69	62	56																		
3½ x 3½ x 5/8	90			75	70	65	60	54																
6 x 3½ x 3/8	98	88		85	81	76	72	68	64	60	56													
4 x 3½ x ½	98			83	78	73	69	64	59	54														
4½ x 3 x ½	98			84	80	75	71	66	61	57														
5 x 3½ x 7/16	100	88		89	85	81	77	73	69	65	61	57												
6 x 4 x 3/8	104	94		93	89	86	82	78	74	71	67	63	59	56										
5 x 5 x 3/8	104	94		92	88	84	80	76	72	68	64	60	57											
3½ x 3½ x 9/16	100			81	75	69	63	58																
4 x 3 x 9/16	100			86	82	77	72	67	62	57														
3½ x 2½ x 11/16	96			82	76	70	64	59																
3½ x 3 x 5/8	100			82	76	70	65	59																
4 x 4 x ½	106			89	83	78	73	68	63	58														
5 x 3 x ½	106	92		90	85	80	75	70	65	60														
5 x 4 x 7/16	108	95		96	92	88	84	80	76	72	68	64	60											
7 x 3½ x 3/8	111	100		93	88	83	78	73	69	64	59													
4 x 3½ x 9/16	109			92	87	81	76	71	65	60														
4½ x 3 x 9/16	109			94	89	84	79	74	69	64	59													
6 x 3½ x 7/16	114	102		98	94	89	84	79	74	70	65	60												
3½ x 3½ x 5/8	110			88	82	76	69	63																
4 x 3 x 5/8	110			95	89	84	78	73	68	62														
3½ x 3 x 7/16	108			89	83	76	70	64																
5 x 3½ x ½	114	100		101	96	92	87	83	78	74	69	65												
4 x 4 x 9/16	118			99	93	87	81	76	70	64														
5 x 3 x 9/16	118	102		100	95	89	84	78	72	67														
5 x 5 x 7/16	122	108		106	102	97	93	88	83	79	74	70	65											
6 x 4 x 7/16	122	108		108	104	99	95	91	86	82	78	74	69	65										
5 x 4 x ½	122	108		108	104	99	95	90	86	81	76	72	67											
4 x 3½ x 5/8	120			102	96	90	84	78	72	66														
4½ x 3 x 5/8	120			104	99	93	88	82	77	72	66													
3½ x 3 x 3/4	116			96	89	82	76	69																
3½ x 3½ x 11/16	118			96	89	82	75	68																
4 x 3 x 11/16	118			103	97	91	85	79	73	67														
6 x 6 x 3/8	128	118		116	112	108	105	101	97	93	89	85	81	77	73	69								
7 x 3½ x 9/16	129	117		107	102	96	91	85	80	74	69													
5 x 3½ x 9/16	128	112		113	108	103	98	93	88	83	78	73	68											
6 x 3½ x ½	130	116		112	106	101	96	90	85	80	74	69												
4 x 4 x 5/8	130			109	102	96	90	83	77	71														
5 x 3 x 5/8	130	112		111	105	99	93	87	81	75														
3½ x 3 x 9/16	124			103	95	88	80	73																
4 x 3½ x 11/16	130			109	102	96	89	83	76	70														
4½ x 3 x 11/16	130			114	108	102	96	90	84	78	72													
3½ x 3½ x 3/4	128			104	96	89	81	73																
4 x 3 x 3/4	128			111	104	98	91	85	78	72														
6 x 4 x ½	138	124		123	118	113	109	104	99	94	89	84	79	75										
5 x 5 x ½	138	124		121	115	110	105	100	95	89	84	79	74											
5 x 4 x 9/16	136	120		121	116	111	106	100	95	90	85	80	75											

¾ rivets
Short legs out

DOUBLE ANGLE TRUSS MEMBERS

$\frac{3}{8}$ b-b
$f_c = 16000 - 70\frac{l}{r}$

C. L. SHEDD

2 Ls.	Tension			Compression																				
	1h	2h	3h	L=6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
8 × 3½ × 7/16		130		116	109	103	96	90	84	77														
5 × 3½ × 5/8	140	122		125	119	114	108	103	97	92	86	81	75											
7 × 3½ × ½	146	132		122	116	110	104	97	91	85	79													
4 × 4 × 11/16	140			118	111	104	96	89	82															
4 × 3 × 13/16	138			119	112	105	98	91	84	77														
5 × 3 × 11/16	140	122		121	115	108	102	95	89	82														
6 × 3½ × 9/16	144	128		125	119	113	107	102	96	90	84	78												
6 × 6 × 7/16	150	136		135	130	126	121	117	112	107	103	98	93	89	84	80								
4 × 3½ × ¾	141			119	112	105	98	91	84	77														
4½ × 3 × ¾	141			124	117	111	105	98	92	86	79													
5 × 4 × 5/8	149	131		133	127	121	116	110	105	99	93	88	82											
6 × 4 × 9/16	154	138		138	132	127	122	116	111	105	100	95	89	84										
5 × 5 × 9/16	154	138		135	129	123	117	111	105	100	94	88	82											
5 × 3½ × 11/16	152	134		136	130	124	118	113	107	101	95	89	83											
4 × 3½ × 13/16	151			127	119	112	104	96	89															
4½ × 3 × 13/16	151			133	126	119	112	106	99	92	86													
4 × 4 × ¾	152			128	120	112	104	97	89															
5 × 3 × ¾	152	132		132	124	117	110	103	96	89	82													
8 × 3½ × ½		148		133	125	118	111	104	97	90														
6 × 3½ × 5/8	160	142		138	132	125	119	112	106	99	93	86												
7 × 3½ × 9/16	163	147		137	130	123	116	109	102	95	88													
5 × 4 × 11/16	164	145		146	139	133	127	121	114	108	102	96	89											
6 × 6 × ½	170	156		153	148	142	137	132	127	122	117	111	106	101	96	91								
5 × 3½ × ¾	164	144		148	141	135	128	122	116	109	103	97	90											
4 × 4 × 13/16	164			137	128	120	112	104	95															
5 × 3 × 13/16	164	142		142	134	127	119	112	105	97	90													
6 × 4 × 5/8	170	152		152	146	140	134	129	123	117	111	105	99	93										
5 × 5 × 5/8	170	152		149	142	136	130	123	117	110	104	98	91											
8 × 6 × 7/16		164	153	167	162	158	154	150	146	142	138	133	129	125	121	117	113	109	104	100	96	92		
6 × 3½ × 11/16	174	132		152	145	138	131	124	117	110	103	96												
8 × 3½ × 9/16		165		149	141	133	125	117	109	101	93													
7 × 3½ × 5/8		162		152	144	137	129	122	114	107	99													
5 × 4 × ¾	177	156		157	150	143	136	130	123	116	109	102	96											
5 × 3½ × 13/16	178	154		159	152	145	138	131	125	118	111	104	97											
6 × 4 × 11/16	186	166		167	160	154	147	141	135	128	122	115	109	103										
5 × 5 × 11/16	186	166		162	155	148	141	134	127	120	113	106	99											
6 × 6 × 9/16	190	174		171	165	159	153	147	142	136	130	124	118	112	106	101								
6 × 3½ × ¾	188	168		165	157	150	142	135	127	119	112	104												
5 × 4 × 13/16	190	167		169	161	154	147	139	132	125	117	110	103											
5 × 3½ × 7/8	188	164		170	162	155	148	140	133	126	118	111	104											
8 × 6 × ½		188	174	188	183	178	174	169	164	160	155	151	146	141	137	132	127	123	118	113	109	104		
7 × 3½ × 11/16	197	177		166	158	150	142	134	126	118	109													
8 × 3½ × 5/8		182		165	156	148	139	130	122	113	104													
6 × 4 × ¾	200	180		181	174	167	160	153	147	140	133	126	119	112	105									
5 × 5 × ¾	200	180		176	168	160	152	145	137	129	122	114	106											
6 × 3½ × 13/16	202	180		177	169	161	153	145	137	129	121	113												
6 × 6 × 5/8	210	192		189	182	176	169	163	156	150	143	137	130	124	117	111								
5 × 4 × 7/8	203	178		181	173	165	157	149	141	134	126	118	110											
7 × 3½ × ¾	213	192		181	172	163	154	145	137	128	119	110												
8 × 3½ × 11/16		196	177	179	169	160	151	142	132	123	114													
6 × 4 × 13/16	216	194		195	187	180	172	165	158	150	143	135	128	121	113									
5 × 5 × 13/16	186	166		167	160	154	147	141	135	128	122	115	109	103										
6 × 3½ × 7/8	216	192		190	181	173	164	155	147	138	130													
8 × 6 × 9/16		210	196	211	205	200	195	190	185	179	174	169	164	159	154	148	143	138	133	128	122	117		
8 × 8 × ½		220	206	218	212	207	202	197	192	187	182	177	171	166	161	156	151	146	141	136	130	125	120	
6 × 6 × 11/16	230	210		206	199	192	185	178	170	163	156	149	142	135	127	120								
7 × 3½ × 13/16	229	206		196	186	177	167	158	149	139	130	120												
6 × 4 × 7/8	230	206		208	200	192	184	176	168	161	153	145	137	129	121									
5 × 5 × 7/8	230	206		201	192	183	174	165	156	147	138	129												
6 × 3½ × 13/16	230	204		203	193	184	175	166	157	148	139	130												
8 × 3½ × ¾		216		197	187	177	166	156	146	136	126													
8 × 6 × 5/8		232	214	233	227	221	215	210	204	198	193	187	181	175	170	164	158	155	147	141	135	130		
7 × 3½ × 7/8	245	220		210	200	190	180	170	160	150	140	130												
6 × 6 × ¾	248	228		224	216	208	200	193	185	177	169	162	154	146	138	131								
6 × 3½ × 1	244	216		215	206	196	187	177	168	158	149	139	130											
6 × 4 × 15/16	246	220		222	213	205	197	188	180	172	163	155	147	138	130									
5 × 5 × 15/16	246	220		214	205	195	185	176	166	157	147	138												
8 × 8 × 9/16		246		243	237	231	225	220	214	208	202	197	191	185	179	174	168	162	156	151	145	139	133	
8 × 3½ × 13/16		232		213	202	191	180	170	159	148	138													
7 × 3½ × 15/16	261	236		224	213	203	192	182	171	161	150	140												
6 × 4 × 1	260	232		236	227	218	209	201	192	183	175	166	157	149	140									
5 × 5 × 1	260	232		226	216	206	195	185	175	165	155	144												
6 × 6 × 13/16	268	246		241	232	224	215	207	199	190	182	173	165	157	148	140								
8 × 6 × 11/16		254	234	255	249	243	236	230	224	218	211	205	199	193	187	180	174	168	162	155	149	143		
8 × 3½ × 7/8		248		229	217	206	194	183	172	160	149													
7 × 3½ × 1	276	248		238	226	215	204	193	182	171	160	149												
8 × 8 × 5/8		272	255	270	263	257	250	244	238	231	225	218	212	206	199	193	187	180	174	167	161	155	148	
6 × 6 × 7/8	286	261		258	248	239	230	221	212	203	194	185	176	167	158	149								
8 × 3½ × 15/16		264		244	231	219	207	195	183	171	159													
8 × 6 × ¾		275	234	277	270	264	257	250	243	237	230	223	216	210	203	196	189	183	176	169	162	152		
6 × 6 × 15/16	305	279		274	264	254	245	235	225	216	206	196	187	177	167	158								
8 × 3½ × 1		279		260	247	234	222	209	197	184	171	159												
8 × 8 × 11/16		298	279	294	287	280	273	266	259	252	245	238	231	224	216	209	202	195	188	181	174	167	160	
8 × 6 × 13/16		297	274	300	292	285	278	271	263	256	249	242	234	227	220	213	205	198	191	184	176	169		
6 × 6 × 1	323	295		291	280	270	260	249	239	229	218	208	198	188	177	167								
8 × 8 × ¾		323	302	320	312	304	296	289	281	273	265	258	250	242	234	227	219	211	203	196	188	180		
8 × 6 × 7/8		317	292	321	313	305	297	290	282	274	267	259	251	243	236	228	220	213	205	197	189	182	174	
8 × 6 × 15/16		339	313	342	333	325	317	309	300	292	284	276	268	259	251	243	235	226	218	210	202	194	185	
8 × 8 × 13/16		349	326	344	335	327	318	310	301	293	284	276	267	259	251	242	234	225	217	208	200	191		
8 × 6 × 1		359	331	362	353	344	336	327	318	309	301	292	283	274	265	257	248	239	230	222	213	204		
8 × 8 × 7/8		373	349	369	360	351	342	333	324	315	306	297	288	279	270	261	252	243	234	226	216	207		
8 × 8 × 15/16		399	373	394	384	374	365	355	345	336	326	316	307	297	287	278	268	258	249	239	229	220		
8 × 8 × 1		423	395	419	408	398	388	377	367	357	346	336	326	316	305	295	285	274	264	254	243	233		
8 × 8 × 1 1/16		448	419	442	431	420	409	398	387	376	365	354	343	332	321	310	299	288	277	266	255	244		
8 × 8 × 1⅛		473	441	467	455	443	432	420	409	397	385	374	362	351	339	327	316	304	293	281	269	258		

readily confused than T and C. The next column shows the length in feet for the compression members. Opposite the tension members the number of holes deducted could be placed. The next column shows the section chosen from the table, while the last column shows the number of rivets used. In this case we have used ½″ gussets which give a value for each ¾″ rivet of 7,500 pounds.

The general method used in choosing the sections has already been described. In the case of the top chord we give an alternative in the table. The 5″ x 4″ angles are the most economical, but they are not as commonly found in shops as the 6″ x 3½″ angles. In the case of Ra the 4″ x 3″ angle is used in preference to the others of same area because the 4″ x 3″ angles are also used for several compression members where they are more economical. It is better for the shop to use as few different sizes as possible.

In Fig. 3 we show the method of arranging the computations if the same truss were computed with a slide rule instead of having its stresses determined graphically.

The reaction, as already noted, was 44,800. The load at the end AB is one-half of the usual panel load, that is 4,480. If it is subtracted from the reaction it gives the shear in the end panel, and again deducting the next load we get the shear in the next panel and so on. By taking a section through each panel we cut three members, the stresses in which are unknown. We can apply the third principle given at the first of this article,—that the algebraic sum of the moments about any point must equal zero. If we choose as a point the intersection of the diagonal with one of the chords, we make the moments of these two unknowns equal to zero, therefore the moment of the other chord about this point must be equal to the moment of all of the other forces to one side of the section about this same point. In this way we can find the chord stresses. The simple way of finding the moments at the various panel points is shown in Fig. 3. The moment at any panel point is equal to the moment at the next panel point toward the nearest end plus the shear in the panel multiplied by the length of the panel. These moments divided by the effective depth of the truss, therefore, give the chord stresses. The stresses in the verticals are the shears in the section passing through the vertical but not cutting a diagonal. The stresses in the diagonals are equal to the shear in the panel multiplied by the length of the diagonal and divided by the effective depth. The chord stresses are all checked by checking the last one in the same way that the stress diagram was checked.

In making a detail drawing of the truss, the gauge line of the angles which have but a single gauge line is made to coincide with the stress line, and in the case of the angles having two or more gauge lines that nearest the outstanding leg is used. This leads to a slight but unimportant eccentricity, but, what is more important, it gives a simple detail for the shop, which is always to be considered unless stresses are caused enough larger than those computed to cause an important weakness in the design.

The gussets should be so designed that there will not be a weakness in shear. This is particularly liable to occur in the end gussets. By cutting the gusset with a section and applying our three fundamental rules, this shear may be easily obtained. This is usually the weakest through a line of rivets.

When the ends of the diagonals are cut, either make a square cut, or if beveled have it bevel from the outstanding leg back toward the center of the truss. Never have the leg project to a point. This facilitates the cutting of the angle in the shop, a matter always to be considered.

In buildings where there are large halls, it sometimes becomes desirable to build a truss a whole story deep to carry the floors above. In this case the chords are frequently subjected to bending besides the usual truss stresses. In computing this bending it is not usually necessary to use as large a moment as would be computed by assuming the chord composed of beams each one panel in length. In general it is safe to consider these beams as continuous, that is, to take 8/12 of the moment as usually computed. There are, however, frequent exceptions to this rule which if overlooked would lead to dangerous design. One of these exceptions arises from large concentrated loads giving a bending stress which would be large in comparison with the direct truss stress, or more particularly a large bending in one panel and a much smaller bending in an adjacent panel. In such a case the difference in these two bending moments might be too great for the joint to take care of. Unless the end of the truss is very stiff it is usually best to figure the bending in the end panel as at least 8/10 of that of a simple beam. After the usual stress and bending stress have been computed they should be added together to see that they are not greater than should be allowed. It is safe, as a rule, to allow this combined stress to run up to 16,000 pounds per square inch, but care should be taken that there is sufficient lateral stiffness. A good section to use where the bending is considerable is two channels back to back with the gusset between them. Especial care should be taken in such design that the lateral stiffness is ample. A flange plate added on the top of the truss will often accomplish this result in as satisfactory a way as any. Wooden beams are not a good brace for steel compression members, but a concrete slab within certain limits may be very good. General rules which will fit all cases are very hard to make.

DECORATION & FURNITURE

Details from the Library of the Hotel Gouthiere, Paris

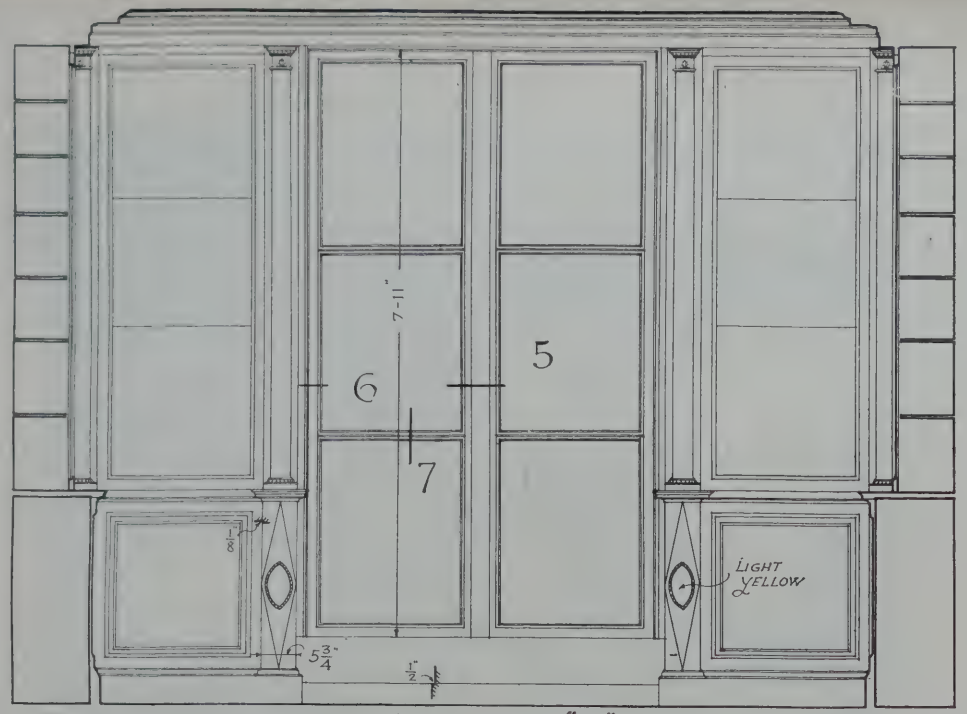
HIDDEN away in unsuspected byways of Paris there still exist many old treasures of an architectural nature, left alone and deserted as the march of progress leads past them and on beyond. One such example is the old structure at No. 9 Rue Pierre Bullet, more fortunate by far than many an old Parisian house in having come into the possession of an owner who values it on account of its traditions as well as for its architectural merits. This old building, some illustrations and details of which were presented in THE ARCHITECTURAL FORUM for March, 1924, was built and occupied by the famous craftsman in metal of the time of Louis XVI, Pierre Gouthiere, and as it stands, surrounded by the shops and homes of small tradesmen, it might be regarded as a symbol of the downfall of French art when the splendor and dignity of the monarchy were swept away by the ruin and chaos which were the result of the revolution.

The grace and elegance and the charm altogether French which characterize the exterior of this old house are found to prevail within. Illustrations, details and a description have already been given of the vestibule or entrance hall and of a small salon, but equally as charming are the staircase hall with its marbleized walls and its graceful circular stairs and the adjoining rooms, one of which is the library of which illustrations and drawings are given here.

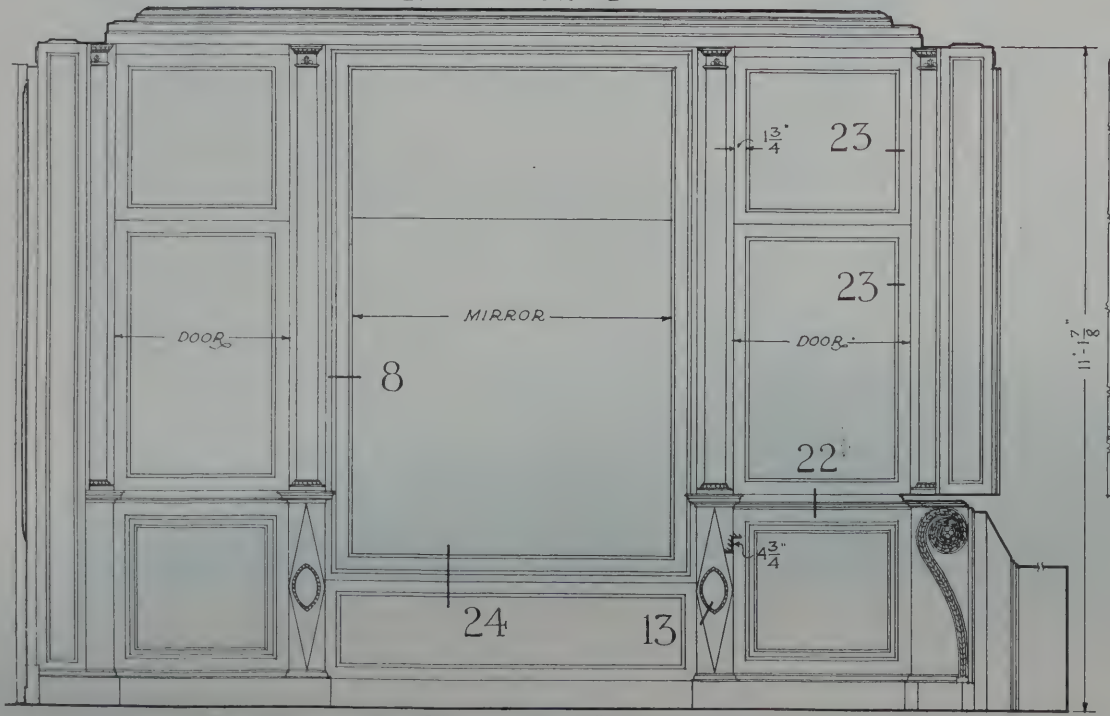
One's first impression of this room is that it is light and delicate in detail and exceedingly rich in color. The wood is of mahogany with a rich, reddish brown finish. The small engaged columns flanking the bookcases rest on a ledge of white marble which runs completely around the room, interrupted only by the openings. This marble ledge is moulded only where it slightly breaks around the columns and pilasters below. The room is a model of good taste in design, detail, balance and color.

Photo. Giraudon

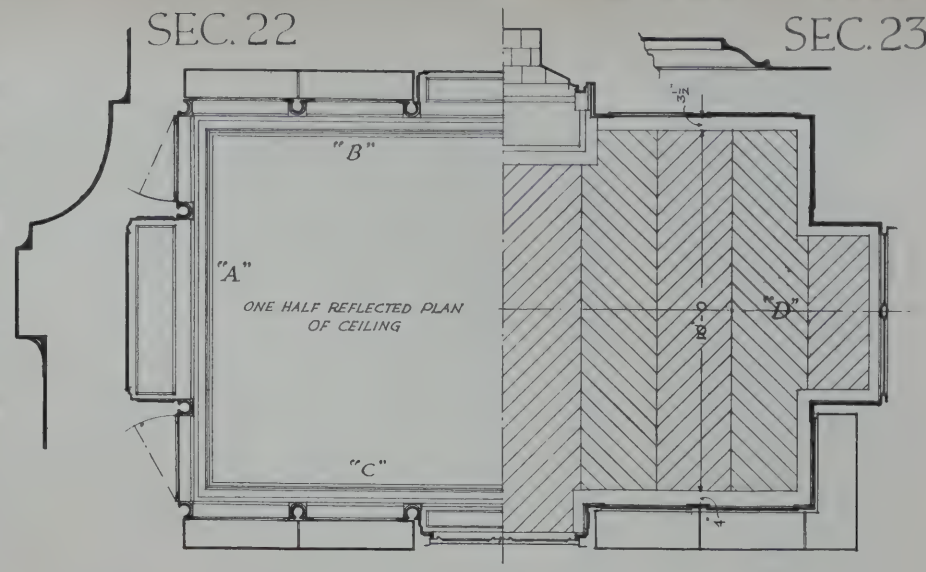
The Library in the Hotel Gouthiere, Paris



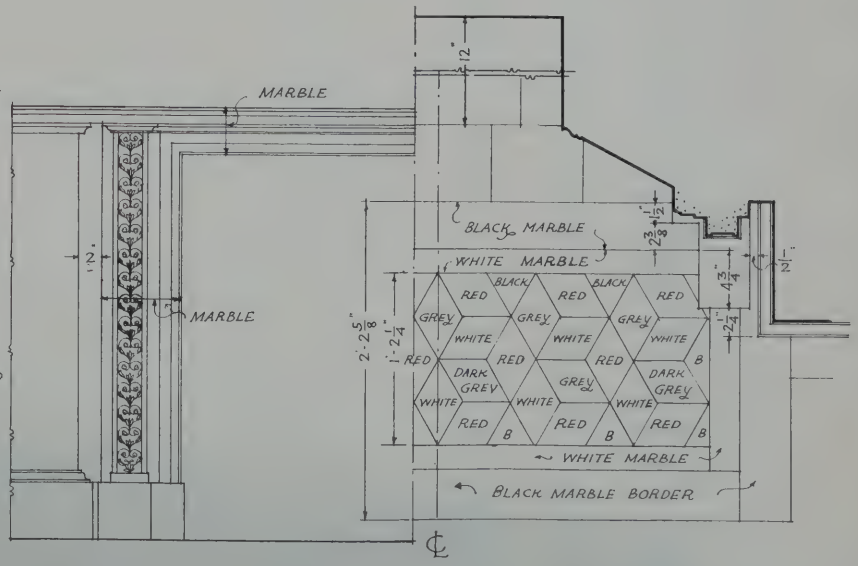
Elevation "D"



Elevation "A"

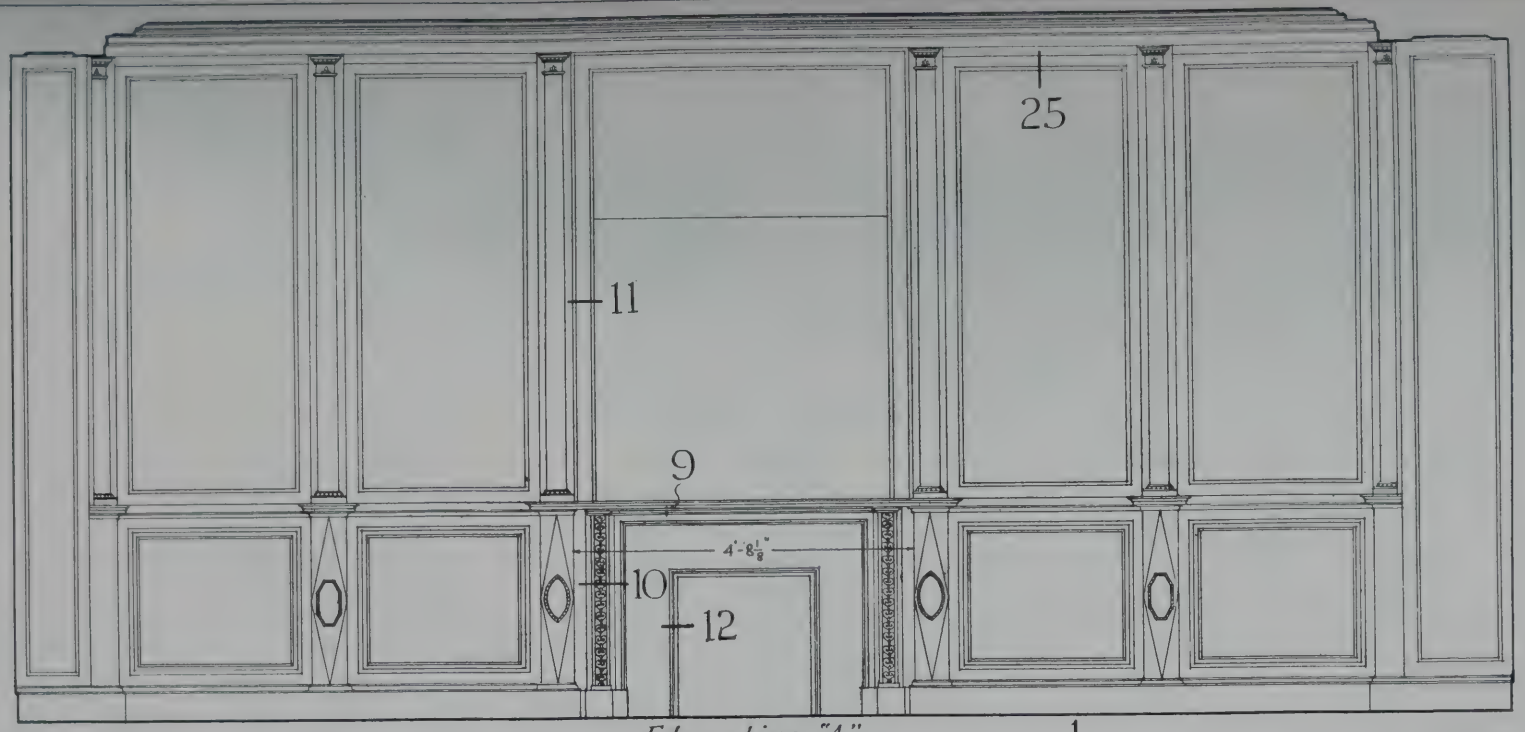


PLAN
Scale 3/16" = 1 Ft.

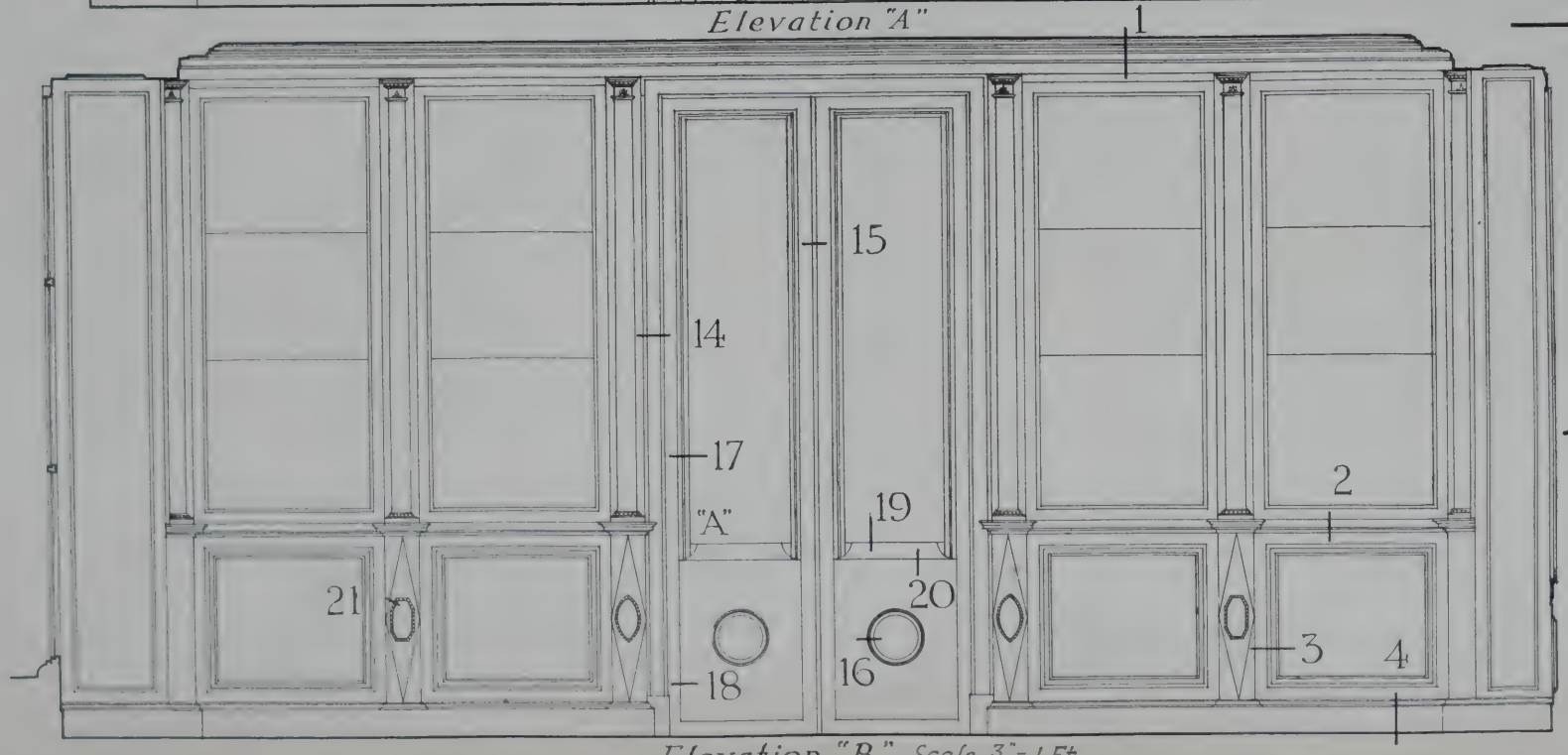


ELEVATION OF MANTEL PLAN
Scale 3/4" = 1 Ft.

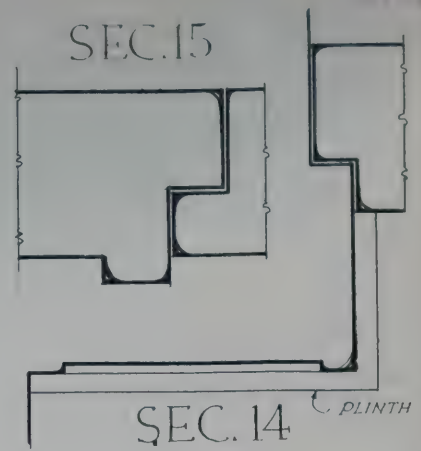
LIBRARY
HOTEL GOUTHIERE
PARIS

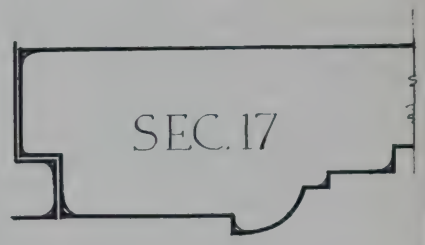


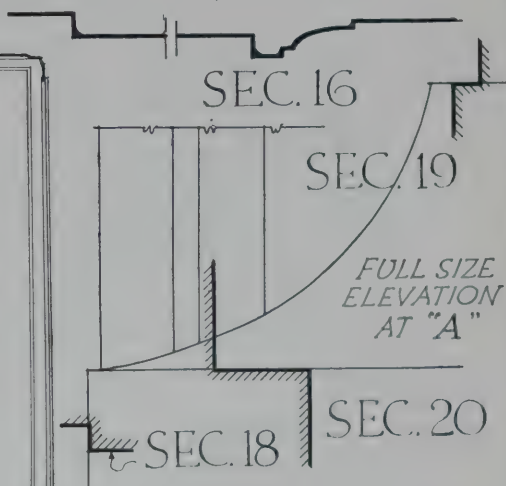
Elevation "A"



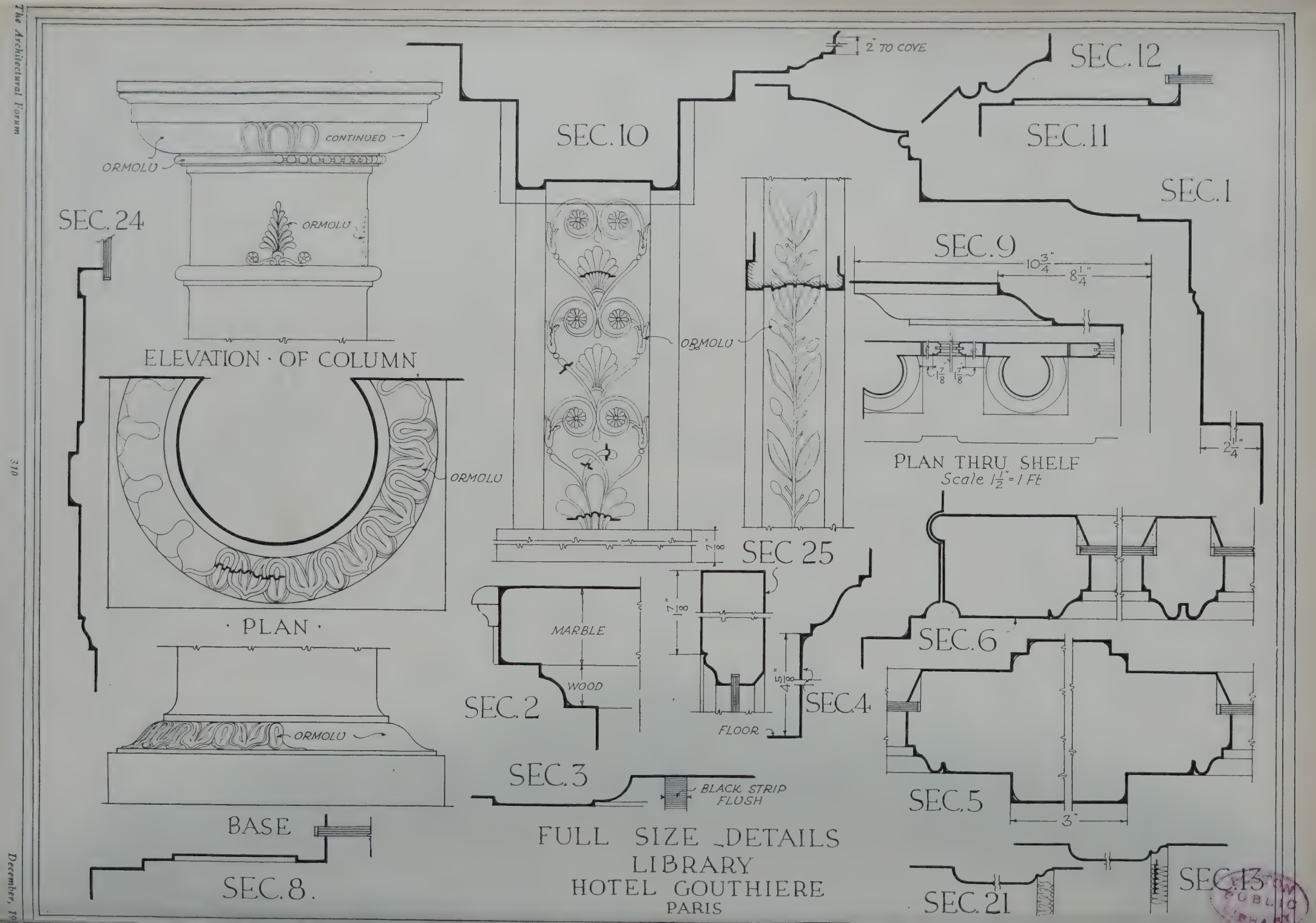
Elevation "B" Scale 3/8" = 1 Ft







DETAILS OF LIBRARY HOTEL GOUTHIERE PARIS



FULL SIZE DETAILS
LIBRARY
HOTEL GOUTHIERE
PARIS

Plate Description

Chamber of Commerce Building, Newark. Plates 77, 78. This 10-story office building, of which Guilbert & Betelle are architects, built in 1922 primarily to house the Chamber of Commerce, was planned to accommodate stores on the two lower floors and offices on the upper floors. The auditorium of the Chamber, which seats 320, together with committee, director's and secretary's rooms, is located on the third floor. The exterior of the building is buff brick with limestone trimmings and cornice on the upper stories. The richly carved entrance door, the work of Maxfield Keck, is in pink Tennessee marble. The construction is fireproof, with steel skeleton frame and concrete slab floors. Vacuum steam is used for the heating. The Public Service Company furnishes electric light and power. The electric elevators are finished in bronze. Hollow metal frames and sash are used for all the windows. The corridors have marble wainscots with plaster above, and terrazzo floors. The cost of this building was 68½ cents per cubic foot.

In design, the exterior facade is pleasantly divided. This is accomplished through the use of ornamental ironwork for the window treatment of the first two stories of the building, which are occupied by stores. In the center of this design of ornamental iron and brass, is the richly carved marble entrance door, which suggests the Renaissance of Spain and Italy.

House of Dr. Harold L. Springer, Rockland, Del. Plates 79-80.—In this Colonial mansion Brown & Whiteside, Architects, have produced a design of unusual consistency and charm. Following examples found in Virginia, the plan shows a main house with two low buildings connected with the main house by arcades. A typical Colonial arrangement of rooms has been followed on the first floor, a hall extending through the house with stairway at one side, which rises above the main entrance. At the rear of this hall a door gives access to the broad covered porch designed in the style of that at Mt. Vernon. On one side a large living room opens onto an arcade which leads to a study in one of the small buildings. On the opposite side of the hall is a square dining room, with pantry and kitchen in the rear. Through the kitchen, which occupies the one-story arcade at this side of the first floor, access is had to the garage, the other small building. Four bedrooms and baths are located on the second floor, connecting by a service stairway with six maids' rooms and bath on the third floor. An unusually fine feeling for scale and proportion as well as accuracy in Colonial detail adds to the house's charm.

HOUSE OF DR. HAROLD L. SPRINGER, ROCKLAND, DEL.

Brown & Whiteside, Architects

EDITORIAL COMMENT

IT is now nearly two years since announcement was made to the architectural and artistic world of the gift by Mr. and Mrs. Robert W. de Forest of a new wing for the Metropolitan Museum, in which were to be permanently housed the many examples of early American art, already collected by the Museum during the past 15 years. These collections, which comprise some of the best examples known of early American furniture, metal work, ceramics, glass, textiles, wallpaper, portraits, and interior architectural woodwork, have now been so arranged as to re-create the atmosphere of typical interiors of the seventeenth and eighteenth centuries.

In collaboration with the Museum authorities, plans for the new American wing were prepared by Grosvenor Atterbury, Architect, in such a way as to make possible the installation of a number of old interiors taken from buildings in practically all of the 13 original states, showing the gradual development of American domestic architecture from Puritan days down through the Colonial and Revolutionary periods to the days of the early Republic. These rooms include examples of old kitchens, living rooms, dining rooms, drawing rooms and ballrooms, accurately rebuilt with practically all of the original details. Reproductions have been used only in some of the earliest rooms where it was impossible to remove the originals intact. Each room contains furniture, hangings, and various ornaments, decorations and details of equipment appropriate to its period. Space does not here permit a detailed description of each room, but we are glad to announce that a series of articles by Richard F. Bach of the Museum's staff, is shortly to appear in THE FORUM, and will take up in turn an analytical description of each of the periods of early American art and architecture, now splendidly represented.

The atmosphere and character as well as the purpose of the new American wing have been successfully established by the court or entrance facade of the building, for which has been used the gracefully proportioned front of the United States Assay building, erected a century ago at No. 15 Wall Street.

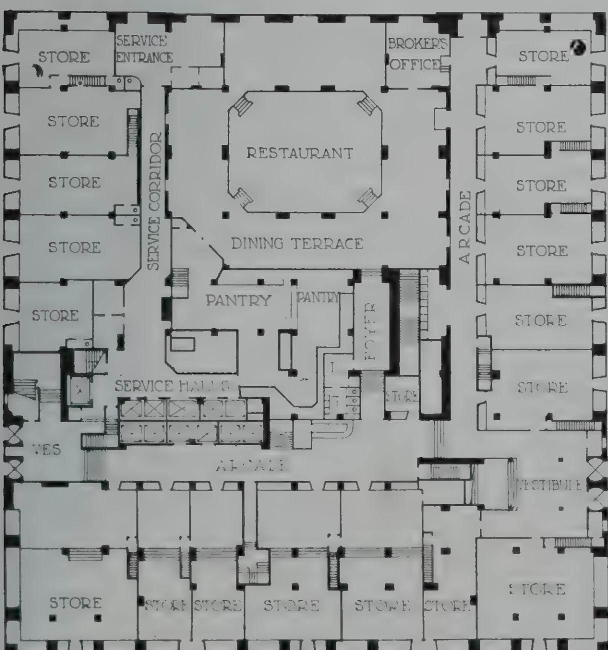
The opening of this new wing on November 10 was an event of importance in the history of American art. The influence of this notable collection of many of the finest examples of early American art will by no means be confined to the present generation; on the contrary it will stand forever as an enduring monument to the artistic appreciation and skilled craftsmanship of the men to whose struggles were due the solid foundations of the Commonwealth.

The New American Wing of the Metropolitan Museum, New York

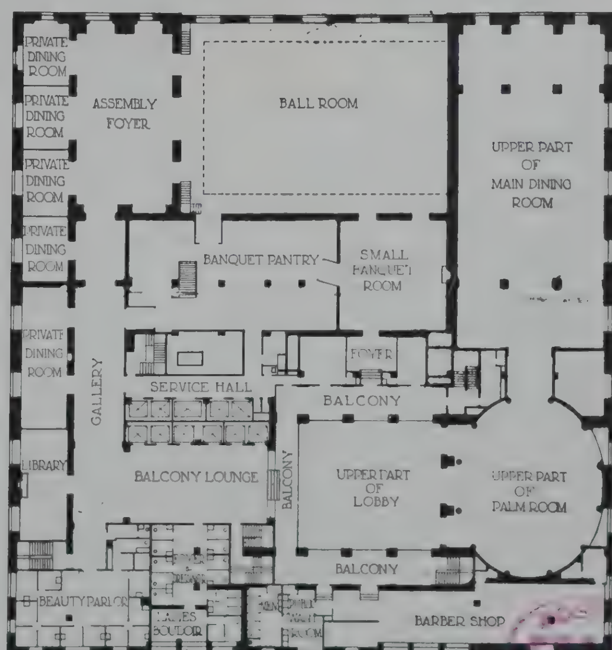
Grosvenor Atterbury, Architect

Front from the Old United States Assay Office, Formerly at No. 15 Wall Street, New York

THE PARK AVENUE FACADE SHOWS AN INTERESTING ARRANGEMENT OF THE REQUIRED SETBACKS



GROUND FLOOR PLAN



BALLROOM FLOOR PLAN

THE ROOSEVELT HOTEL, NEW YORK

GEORGE B. POST & SONS, ARCHITECTS

Photos. Drix Duryea

CORNER OF MAIN LOBBY, LOOKING TOWARD OFFICE
THE ROOSEVELT HOTEL, NEW YORK
GEORGE B. POST & SONS, ARCHITECTS

POST PUBLIC LIBRARY

LOOKING FROM THE OVAL PALM ROOM INTO THE MAIN DINING ROOM
THE ROOSEVELT HOTEL, NEW YORK
GEORGE B. POST & SONS, ARCHITECTS

CORNER OF MAIN DINING ROOM SHOWING FINE COLONIAL DETAIL

THE ROOSEVELT HOTEL, NEW YORK

GEORGE B. POST & SONS, ARCHITECTS

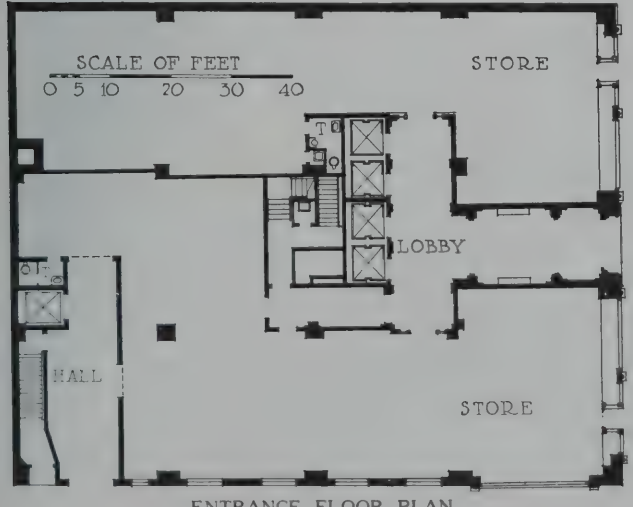
PUBLIC LIBRARY

CHAMBER OF COMMERCE BUILDING, NEWARK

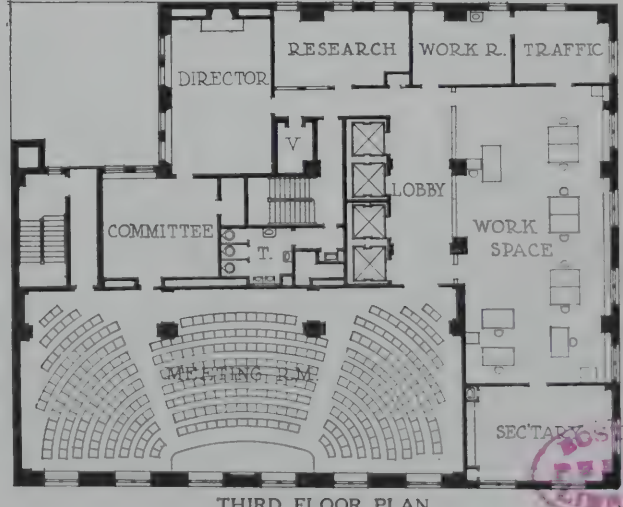
GUILBERT & BETELLE, ARCHITECTS

Photos. Drix Duryea

THE ELEVATOR LOBBY HAS A VAULTED CEILING IN DULL GOLD



ENTRANCE FLOOR PLAN



THIRD FLOOR PLAN

CHAMBER OF COMMERCE BUILDING, NEWARK
GUILBERT & BETELLE, ARCHITECTS

GARDEN FRONT

Photos. Tebbs & Knell

ENTRANCE FRONT

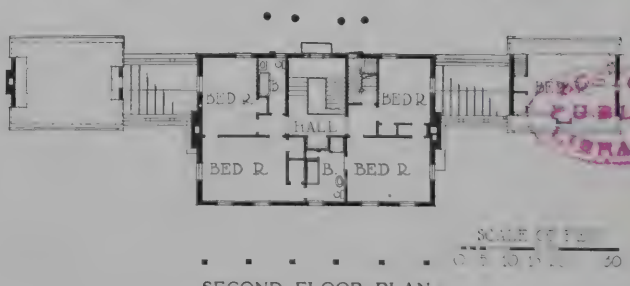
HOUSE OF DR. HAROLD L. SPRINGER, ROCKLAND, DEL.

BROWN & WHITESIDE, ARCHITECTS

Photos. Tebbs & Knell

DETAIL OF THE GARDEN FRONT

FIRST FLOOR PLAN



SECOND FLOOR PLAN

PUBLIC LIBRARY

HOUSE OF DR. HAROLD L. SPRINGER, ROCKLAND, DEL.

BROWN & WHITESIDE, ARCHITECTS

The Forum Studies of European Precedents

Baroque Doorways in Genoa

Doorway of the Church of San Siro, Piazza San Siro, Genoa

THE abandonment of conformity to constructive principles, which was the decisive cause of the decay of Renaissance architecture in Italy, was due quite as much to the example set by Michaelangelo as to any other one cause. The qualities in his work which appear to have led architecture into the dark and devious ways of the Baroque decadence were first and chiefly its insincerity, in which may be included not only an absence of truthful construction and logical use but also the tendency to employ architectural forms as mere applied decoration. Under the conviction that so great a personality could do nothing wrong, every peculiarity or vulgarity of detail was carefully copied by those who came under the influence of his work. One of these followers and pupils of Michaelangelo was Galeazzo Alessi, who built many splendid palaces in Genoa during the early part of the sixteenth century, the doorways of which were excellent examples of the best period of the Baroque style.

Some of these doorways possess delicate and refined detail, handled with freedom and skill, showing classic orders used in new proportions and arrangements. Several of these doorways show the richly carved entablatures surmounted by broken pediments so characteristic of the Baroque style and the vigorously executed cartouches and scrolls expressive of the decadent spirit of the last days of the Italian Renaissance.

© *The Architectural Forum*

DOORWAY, NO. 8 RESTIERE DEL MOLO, BANCO DI ROMA, GENOA

© *The Architectural Forum*

DOORWAY, PALAZZO CATALDI, NO. 4 VIA GARIBALDI, GENOA

© *The Architectural Forum*

BOSTON PUBLIC LIBRARY

PIAZZA DOORWAY, PALAZZO DORIA A FASSALO, GENOA

© *The Architectural Forum*

DOORWAY, PALAZZO SERRA, NO. 12 VIA GARIBALDI, GENOA

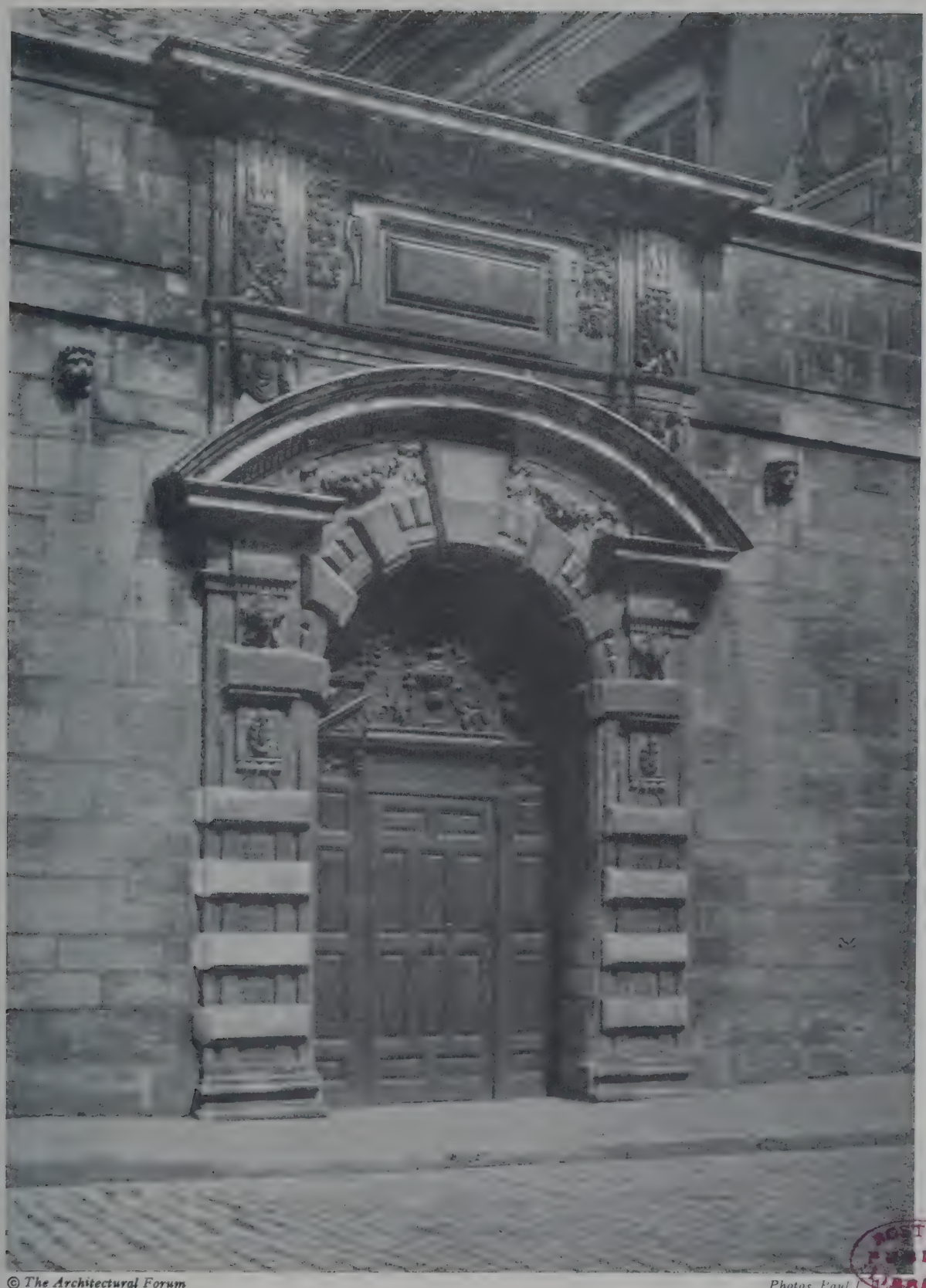
© *The Architectural Forum*

DOORWAY, PALAZZO PODESTA, NO. 7 VIA GARIBALDI, GENOA

© *The Architectural Forum*

BOSTON PUBLIC LIBRARY

DOORWAY, PALAZZO REALE, NO. 10 VIA BALBI, GENOA



© The Architectural Forum

Photos. Paul J.

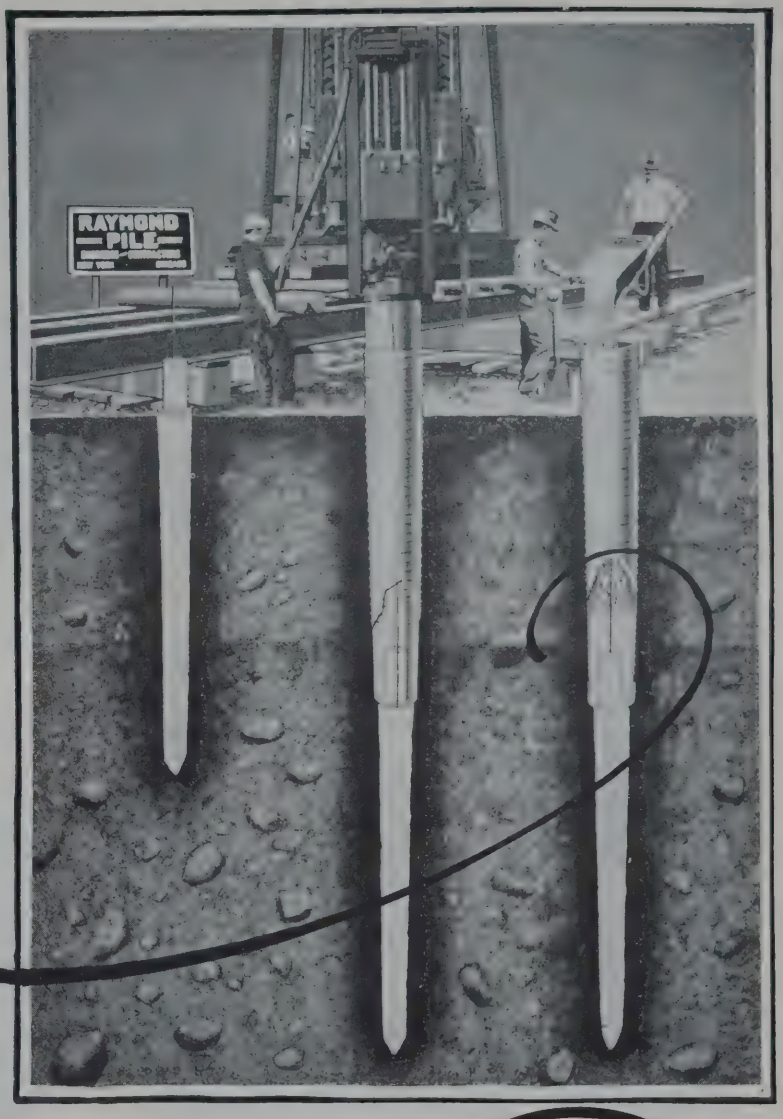
BOSTON PUBLIC LIBRARY

DOORWAY, HOTEL VOGUE, DIJON

The Forum Studies of European Precedents; Plate 16

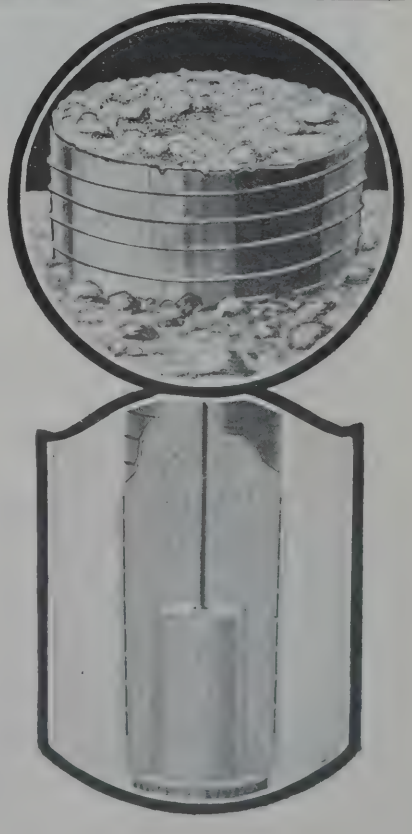
Raymond

COMPOSITE
WOOD & CONCRETE
PILES



They will cut your cost per foot where piles must be over 40 ft. long or water level is not over 22 ft. below cut-off. And you can be certain of perfect alignment and maximum strength throughout.

The joint....
—develops in excess of 80% of the strength of the wood section
—insures exact driving alignment
—is bonded to the concrete column all the way up.
—investigate



Raymond Concrete Pile Co.
New York: 140 Cedar St. Chicago: 111 W. Monroe St.
RAYMOND CONCRETE PILE CO., Ltd.
Montreal, Canada

Branch Offices in all Principal Cities

"A form for every pile—A pile for every purpose"

KEWANEE

基灣拿在中國上海

"Kewanee in Shanghai, China"

ROBERT DOLLAR BUILDING
Shanghai, China
Heated by two No. 312 Kewanee Smokeless Firebox Boilers

In selecting the heating boiler for this building, the fixed policy of the Dollar shipping interests was followed requiring *best quality regardless of first cost,* the same as is given their passengers:—like the Dollar line service.

For centuries, smoldering heat from braziers, full of red hot lumps of powdered coal puddled with clay, has smoked up these homes of China.

KEWANEE *Steel Heating Boilers. Nationally and Internationally Known*

KEWANEE BOILER COMPANY KEWANEE, ILLINOIS

Steel Heating Boilers, Radiators, Tanks, and Water Heating Garbage Burners

BRANCHES

ALTANTA, GA.	1522 Candler Bldg.	DETROIT, MICH.	1772 W. LaFayette Blvd.	ST. LOUIS, MO.	4200 Forest Park Blvd.
CHARLOTTE, N. C.	135 Brevard Court	EL PASO, TEXAS	226 Mesa Ave.	SALT LAKE CITY, UTAH	204 Dooly Bldg.
CHATTANOOGA, TENN.	1226 James Bldg.	GRAND RAPIDS, MICH.	402½ Mich. Trust Bldg.	SAN ANTONIO, TEXAS	502 Calcasieu Bldg.
CHICAGO, ILL.	822 W. Washington Blvd.	INDIANAPOLIS, IND.	221 Indiana Term. Warehouse	SAN FRANCISCO, CALIF.	Postal Telegraph Bldg.
CINCINNATI, OHIO	P. O. Box 75	KANSAS CITY, MO.	2014 Wyandotte St.	SEATTLE, WASH.	Central Bldg.
CLEVELAND, OHIO	Superior Ave., N. E., at 17th St.	LOS ANGELES, CALIF.	420 E. Third St.	SPOKANE, WASH.	506 Empire St. Bldg.
COLUMBUS, OHIO	510 Comstock Bldg.	MEMPHIS, TENN.	1812 Exchange Bldg.	TOLEDO, OHIO	1121-22 Nicholas Bldg.
DALLAS, TEXAS	809 Southwestern Life Bldg.	MILWAUKEE, WIS.	835 Merchants & Mfg. Bk. Bldg.	NEW YORK CITY, N. Y.	47 West 42nd St.
DENVER, COLO.	1226-1228 California St.	MINNEAPOLIS, MINN.	708 Builders Exchange Bldg.	PHILADELPHIA, PA.	510 Real Estate Trust Bldg.
DES MOINES, IOWA	315 Hubbell Bldg.	PITTSBURGH, PA.	Empire Bldg.		

DOMINION KEWANEE BOILER COMPANY, LTD., Toronto, Ont.

Plaster free from cracks—

THE effect of the most graciously conceived architectural design is marred by cracked plastering.

Many architects, therefore, as a PRECAUTIONARY measure specify a plastering base which is also a reinforcement.

KNO-BURN Metal Lath has for so many years proven so satisfactory for this purpose that a trial almost invariably results in its continued use.

This nationally known lath has every attribute of the perfect plastering base—absolute "keying" qualities, marked economy in the use of mortar, a flexibility that commends its use especially for ornamental plastering, combined with a firm, rigid surface that permits maximum coverage.

While the cost of using KNO-BURN Metal Lath throughout in residential work is inconsequential compared with the advantages derived, yet where expense must be kept down to minimum, it is recommended that this fire and crack-preventing plastering base be used in the ceilings of principal rooms, in the bathroom and over the heating plant.

May we send your specification writer samples and copy of our "Recommended Specifications?"

NORTHWESTERN EXPANDED METAL CO.

1234 Old Colony Bldg., CHICAGO

Kno-Burn Metal Lath

"THE STEEL HEART OF PLASTER," STOPS FIRE—PREVENTS CRACKS

"Every church or secular auditorium ~either meets a recognized economic need~or it fails. And poor acoustics is a bid to failure."

—*MacDowell*

The experience of our clients shows that correctly designed acoustics is a most important investment. And not expensive. One theatre owner got better productions for his re-designed house—at an increased cost of only one dollar per day interest charges. Send for the book many architects are now discussing, "Acoustics in Building Design." Free.

MACOUSTIC ENGINEERING COMPANY, INC.
BULKLEY BLDG., 1501 EUCLID AVENUE
CLEVELAND, OHIO

NATIONAL ACADEMY OF SCIENCE BUILDING
Washington, D. C. Bertram G. Goodhue, *Architect*

Ceiling and roof dome of Central Hall in Guastavino Construction with soffit course of

AKOUSTOLITH *Sound Absorbing Tile*

upon which the artist and architect has applied a highly ornamental design in color and gold.

This is an original conception of Mr. Goodhue in combining an efficient acoustical treatment with a highly decorative design.

R. GUASTAVINO COMPANY

40 Court St., Boston, Mass. 1133 Broadway, New York, N.Y.

Representatives in Canada

JOHN LINDSAY
Toronto, Ontario

C. G. PORTER & CO.
Montreal, P. Q.

WILLIAM J. BANKS
Quebec, P. Q.

CERAMICS IN ANCIENT EGYPT ⊙ BABYLONIA ⊙ AND ASSYRIA

ARCHITECTURAL MONOGRAPH NUMBER TWO ~ NOW READY

THIS thirty-two page publication, profusely illustrated with authentic examples of historic precedents showing the utilization of ceramics in the architecture of the period, is the second in a valuable series of fourteen Monographs. Tiles — their historical lineage and earliest uses in the oldest civilizations—are discussed authoritatively and completely by Rexford Newcomb, Professor of History of Architecture, University of Illinois, with emphasis on the various styles of each of the three countries.

Monograph No. 2 provides an opportunity for architects, artists and designers to familiarize themselves with the ancient motifs, designs and stylistic effects achieved upon floors, walls and other surfaces with tiles. In this series, present-day tendencies in decorative expression are readily traced to their primitive origin. Ceramic derivations from the earliest times are brought out clearly.

Copies of this second Monograph, and succeeding issues of the series, will be forwarded to interested architects upon request. Please make request on your office stationery.

ASSOCIATED TILE MANUFACTURERS

BEAVER FALLS PENNSYLVANIA

PRODUCERS OF *Beautiful* TILES

Alhambra Tile Company
American Encaustic Tiling Co. Ltd.
Beaver Falls Art Tile Co.
Cambridge Tile Mfg. Co.
Grueby Faience & Tile Co.
Matawan Tile Co.
Mosaic Tile Co.
National Tile Company
Old Bridge Enameled B. & Tile Co.
Perth Amboy Tile Works
The C. Pardee Works
United States Encaustic Tile Works
Wheeling Tile Company

SIMPLEX SMOKELESS ·STEEL· BOILERS

Lutheran Memorial Hospital, Chicago.
Heated by Simplex Smokeless Boilers.
Worthman & Steinback, Chicago, architects.
J. H. Olson, Chicago, heating contractor.

Arc-welded—with steel's own strength

When you consider (added to the economy feature of Simplex Boilers) the fact that every seam is electrically welded, thus gaining 98% of the strength of steel plate itself, you begin to realize that this boiler is well worth investigating.

And the Simplex will save fuel (any fuel, oil included)—25% at least. Thus for the cost of cast-iron your client gets a *welded steel* boiler—one that turns even the soot and smoke into heat. Easy to clean; easy to tend. One piece construction; and saving of floor-space.

Let us send you details of this scientifically-right boiler. Your client will appreciate your investigation of the Simplex. Drop us a line.

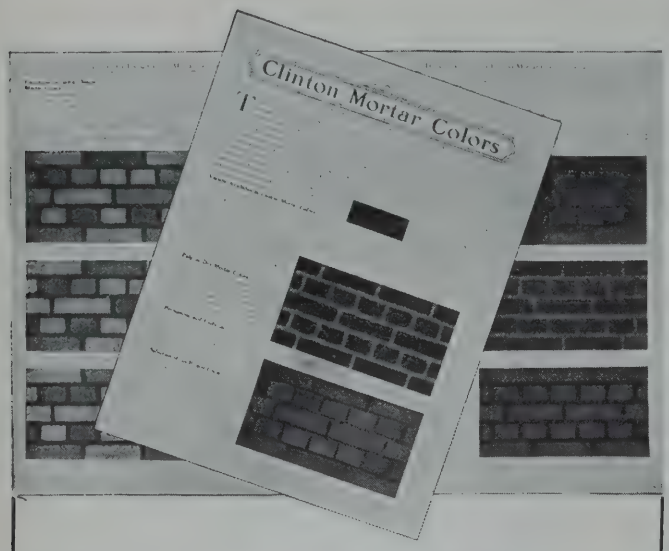
HEGGIE-SIMPLEX BOILER CO., JOLIET, ILL.

CHICAGO SHOW ROOMS: 2436 WEST FIFTEENTH STREET

BALTIMORE CHARLOTTE, N. C.
CLEVELAND CINCINNATI
COLUMBUS DENVER DETROIT
GRAND RAPIDS, MICH.
HOUSTON INDIANAPOLIS

SIMPLEX

JOLIET, ILL. KANSAS CITY, MO.
MEMPHIS MINNEAPOLIS
MILWAUKEE NEW YORK
OKLAHOMA CITY
OMAHA PITTSBURGH ST. LOUIS



The Whole Story of Mortar Colors

HERE is the most complete guide to the use of Mortar Colors ever published. It tells, in detail, just how to produce brick mortar of many different colors and illustrates these colored mortars in combination with many kinds of brick.

It also illustrates, in color, several shades of stucco and tells just how to produce these shades with Clinton Mortar Colors.

A card will bring you this new folder, just off the press.

The Clinton Metallic Paint Co.
5 Clinton Road
Clinton, N. Y.

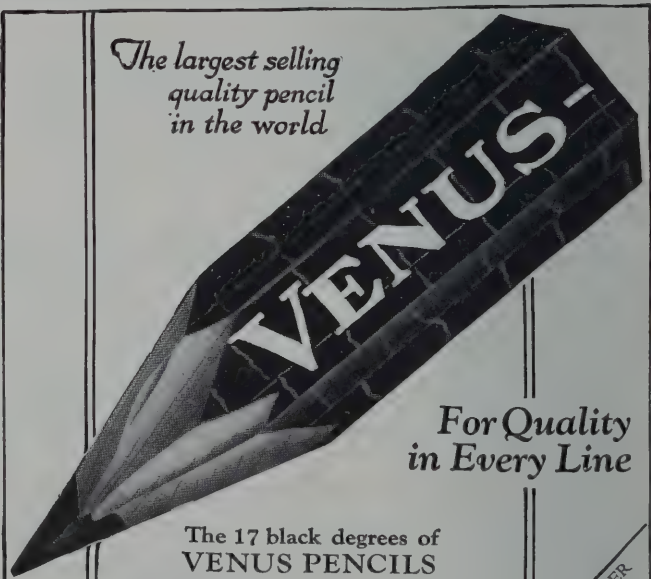
Clinton Mortar Colors

Nature's Permanent Colors. Made since 1887.

BATCHELDER TILES

"Fountain of the Seasons"
Design No. 730
BATCHELDER-WILSON COMPANY
2633 Artesian St., Los Angeles

The largest selling quality pencil in the world



For Quality in Every Line

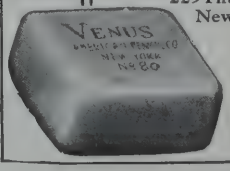
The 17 black degrees of
VENUS PENCILS
meet every pencil demand—with superlative smoothness. For drafting, sketching and writing, they are the world's accepted standard.

Plain Ends, per dozen . . . $1.00
Rubber Ends, per dozen . . 1.20

At Stationers and Stores throughout the world

American Lead Pencil Co.
229 Fifth Avenue
New York

Venus Erasers made in 12 sizes



Mail coupon for free sample

Send Samples VENUS degrees checked—and a VENUS ERASER
For bold, heavy lines . . . 6B-5B-4B-3B
For general writing and sketching . . . 2B-B-HB-F-H
For clean, fine lines . . . 2H-3H-4H-5H-6H-7H-8H-9H
For delicate, thin lines . . .

Name .....
Address .....
Profession .....

The Garage Building Business

MODERN idea, multi-floor parking and storage garages adjacent to office buildings, department stores, hotels and theatres are looked upon as a business necessity—because of the increasing use of the automobile for quick, convenient transportation, for shopping and other purposes.

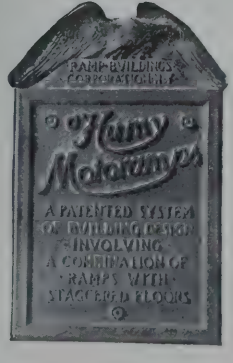
EVERY Architect is desirous of developing new business. The Garage Building Business still remains untouched by a great many Architects, simply because the extent to which it is developing is not fully realized.

The Record of Contracts signed by this Company for the use of the d'Humy Motoramp System of Inter-Floor Travel discloses a total of 1,265,598 sq. ft. of floor area for the months of August, September and October. This activity is country-wide as evidenced by the fact that these garages are located in the following cities:

Atlanta, Ga.	Chicago, Ill.	Miami, Fla.
Memphis, Tenn.	St. Louis, Mo.	Seattle, Wash.
Cincinnati, O.	Providence, R.I.	Los Angeles, Calif.
Columbus, O.	Detroit, Mich.	New York, N.Y.
	Montreal, Que., Can.	

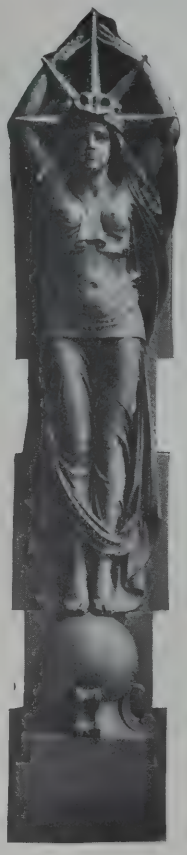
Further, the Garage Industry is developing a very definite science with which Architects will wish to maintain their contact.

The Architect who is not receiving our Garage Design Data Sheets (sent without obligation), will wish to have those issued to date, as well as have his name recorded for future issues.

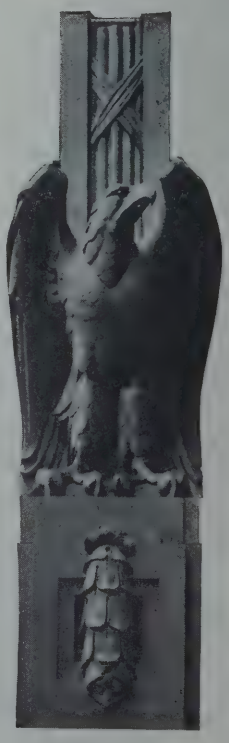


RAMP BUILDINGS
CORPORATION

21 East 40th Street New York, N. Y.



BUILD WITH TERRA COTTA



These illustrations represent ornamentations on the new FRANK & SEDER store, (The Ballinger Co., Architects) now being erected at Market and 11th Streets, Philadelphia. This building is to be faced and trimmed with our White Matt Glazed Architectural Terra Cotta.

The Architects and owners naturally selected ARCHITECTURAL TERRA COTTA as one of the best mediums to secure permanency, and at the same time secure the artistic effects that would be prohibitive in cost by the use of other materials.

CONKLING-ARMSTRONG TERRA COTTA CO.
Philadelphia, Pa.

Sales Office:
410 Denckla Building

General Office and Factory:
Wissahickon Avenue and Juniata Street

CLOISTER BRICK

A BRICK that will bring out the utmost beauty of your designs. Its soft, even texture, like silk velvet, gives to the finished brick wall the coveted charm of simplicity and of quiet dignity.

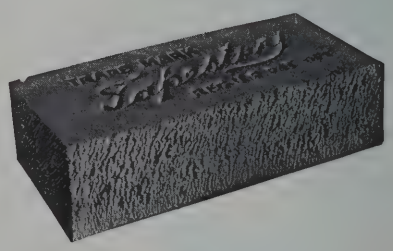
The four shades of red and brown in which CLOISTER BRICK are made befit its distinctive texture. They are rich—glowing. They give life and character to your structure.

CLOISTER BRICK are shale. They are side cut. They are impervious. They are without glaze —and they are inexpensive.

You will want our booklet "The Cloister Brick." Write Dept. 18

WESTERN BRICK COMPANY
Danville - Illinois
Capacity over One Hundred Million Annually

Fiske Brick



ARCHITECTS who seek distinction in color and texture of face brick find the answer in Fiske Brick.

"TAPESTRY" — The rough-textured brick with a wealth of color variations.

"FISKLOCK" — The two-in-one brick with the beauty of "TAPESTRY."

Fiske & Company

Incorporated

NEW YORK BOSTON WATSONTOWN, PA.

Terra Cótta Cornice of Small Chapel, Cathedral at Parma, Italy
(From a revised and enlarged edition of "Color in Architecture" published by the National Terra Cotta Society)

WHERE PRECEDENT MEETS MODERN REQUIREMENT

Early Italian precedent in Terra Cotta furnishes many motives splendidly adapted to the decorative enrichment of the modern zoning law skyscraper.

Polychrome coloring as perfected in modern Terra Cotta enables low relief ornament to carry effectively at great heights, eliminating necessity of widely overhanging projections for ornamental effect. Mass and silhouette are thus left to assert beautifully their proper dominance.

We will gladly assist architects interested in the use of color by furnishing literature broadly helpful in its treatment of the subject. Address

NATIONAL TERRA COTTA SOCIETY

19 WEST 44th STREET NEW YORK, N. Y.

An object lesson in building upkeep——cleaners at work removing the grime and soot that had accumulated during a quarter of a century on the Rose Building, Cleveland, Ohio.

At small expense and with comparative ease, Northwestern white enamel terra cotta facing is restored to its original freshness and beauty.

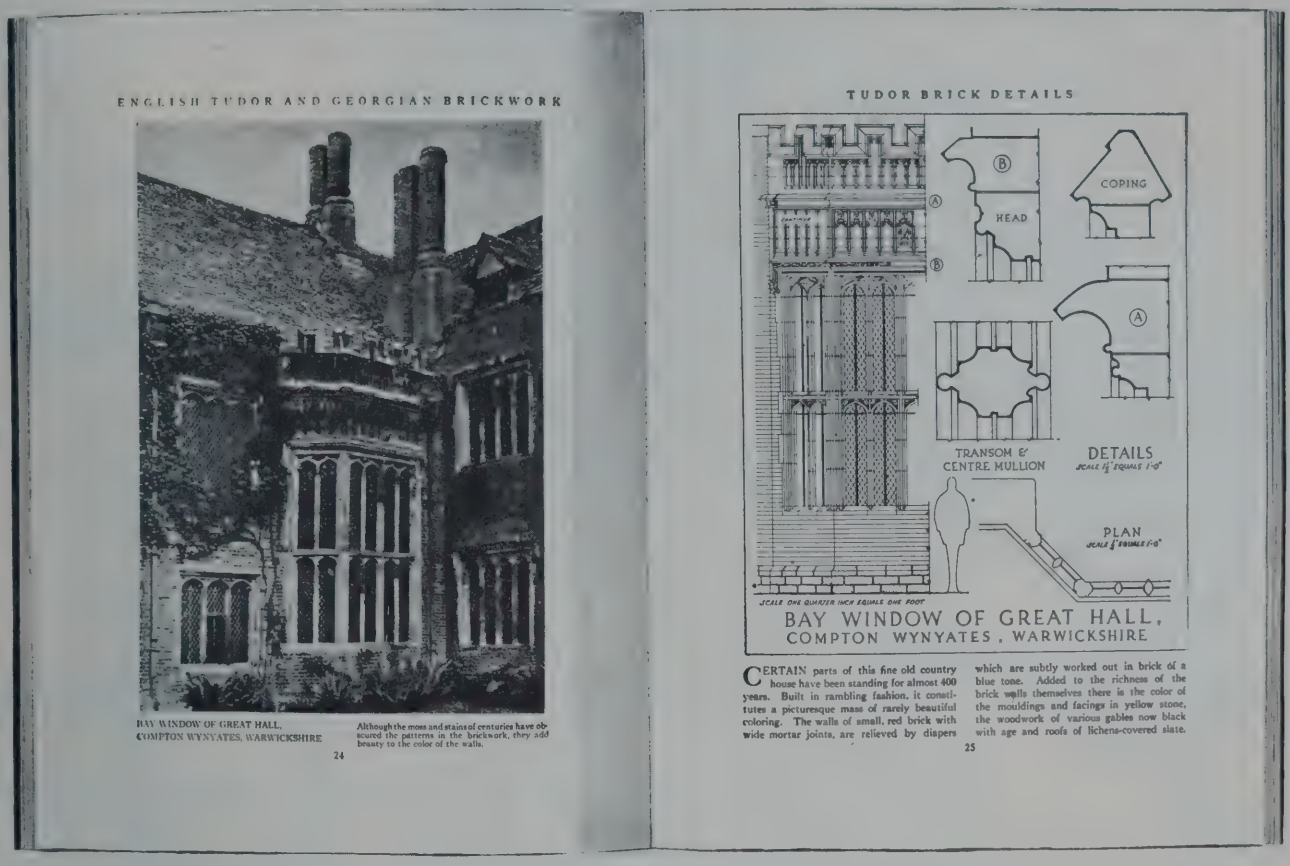
This building was designed by George H. Smith, Architect, and built in 1898.

NORTHWESTERN is a short form of specification for architectural Terra Cotta of superior quality.

THE NORTHWESTERN TERRA COTTA COMPANY

CHICAGO

WESTERN PLANT—THE DENVER TERRA COTTA COMPANY, DENVER, COLORADO



ENGLISH TUDOR AND GEORGIAN BRICKWORK

BAY WINDOW OF GREAT HALL, COMPTON WYNYATES, WARWICKSHIRE

Although the moss and stains of centuries have obscured the patterns in the brickwork, they add beauty to the color of the walls.

24

TUDOR BRICK DETAILS

BAY WINDOW OF GREAT HALL, COMPTON WYNYATES, WARWICKSHIRE

CERTAIN parts of this fine old country house have been standing for almost 400 years. Built in rambling fashion, it constitutes a picturesque mass of rarely beautiful coloring. The walls of small, red brick with wide mortar joints, are relieved by diapers which are subtly worked out in brick of a blue tone. Added to the richness of the brick walls themselves there is the color of the mouldings and facings in yellow stone, the woodwork of various gables now black with age and roofs of lichens-covered slate.

25

Reproduction of two facing pages in "English Precedent for Modern Brickwork." The illustration shows the character of the halftone plates and measured drawings shown in the book.

A NEW BOOK FOR THE DRAFTING ROOM

HERE is a book—"English Precedent for Modern Brickwork"—that will be of real interest to the architect and the architectural draughtsman. The measured drawings will be helpful in the drafting room, while the halftone plates and text give a clear picture of the beauty and craftsmanship of English brickwork.

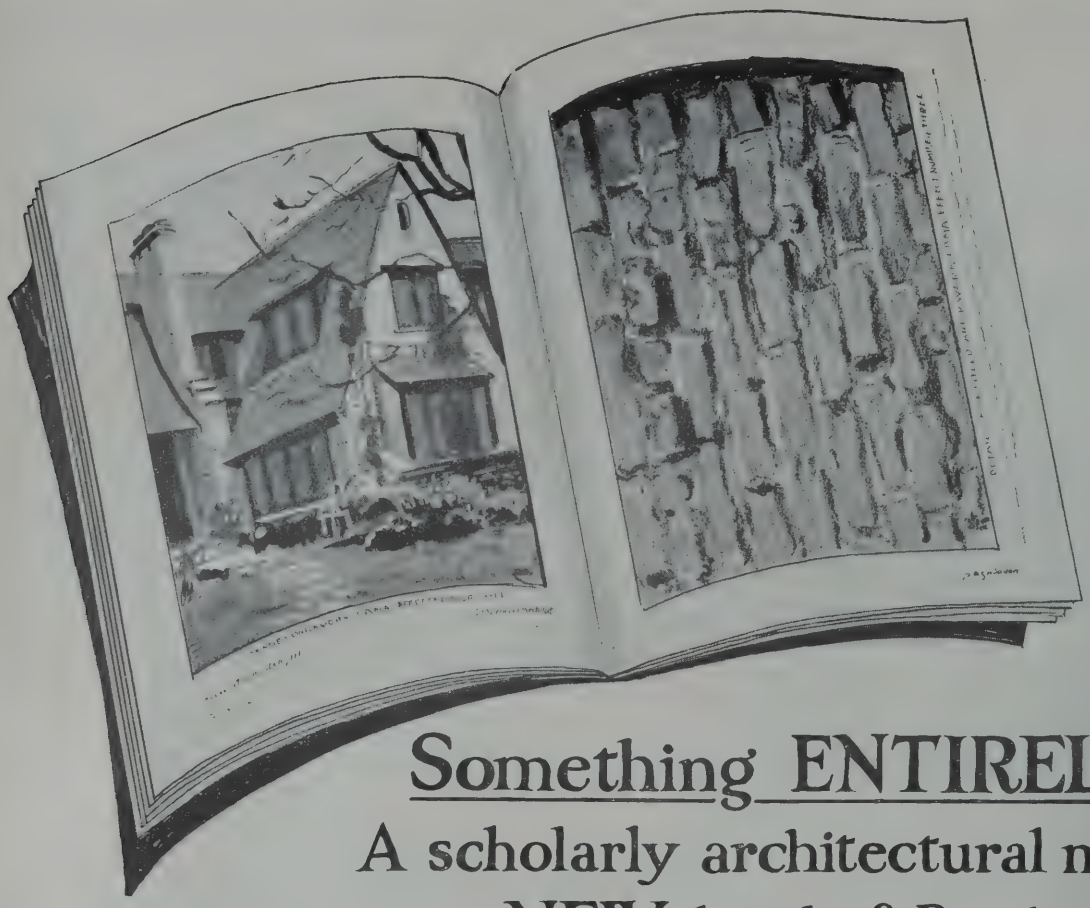
The book is especially timely since much of the best present-day American brickwork finds its inspiration in English precedents.

Among the subjects discussed in the book are: "An Appreciation for English Brickwork," "Chronology of English Brickwork," "Tudor Brickwork," "Georgian Brickwork," "American Brickwork," "English Rubbed, Cut, Moulded Brick and Their American Counterparts," and "Bonds and Mortars in English Brickwork."

The text is illustrated by 43 halftone plates and 28 measured drawings. The colored frontispiece is by Otto Eggers.

"English Precedent for Modern Brickwork" will be sent to any address in the United States or Canada upon receipt of two dollars.

Address, American Face Brick Association, 1751 Peoples Life Building, Chicago, Illinois.



Something ENTIRELY NEW

A scholarly architectural monograph on a NEW kind of Brickwork

THIS IS THE FIRST NUMBER of the first volume of an exceptionally interesting series of publications devoted to various phases of the use of Common Brick, edited by a well-known architect, and by text and large illustrations explains a novel method of securing strong and striking effects with Common Brick. The title is

YOUR COPY IS READY NOW

Drop a card for it in the mail TODAY

BRICKWORK WORKING DETAILS

VOLUME I ~ NUMBER I

"Skintled Brickwork"

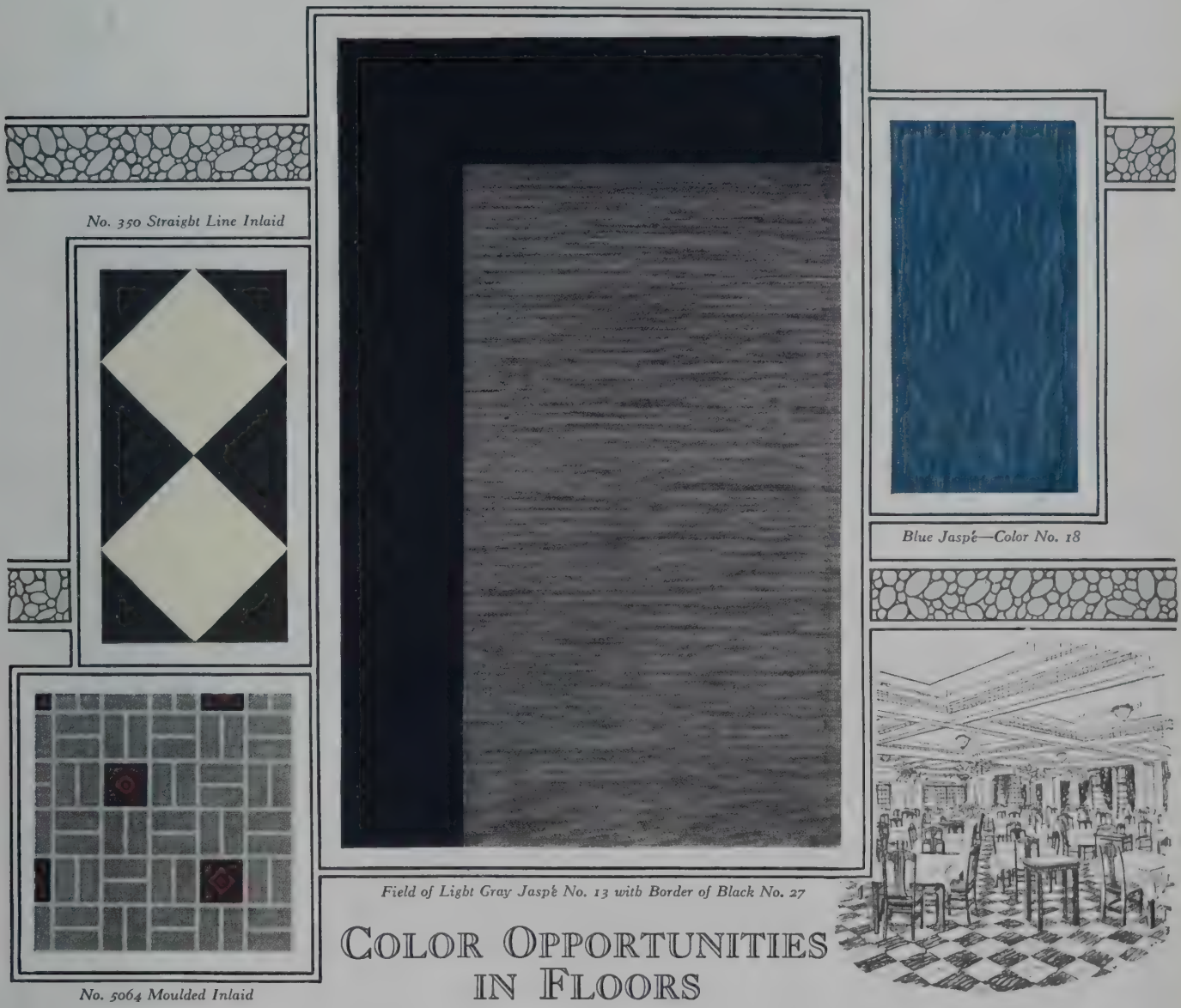
New methods of obtaining interesting surface effects with common brick as developed and exemplified by Chicago architects

This is probably the most interesting application of any constructional material that has been developed in recent years, and the photographic views of the various possibilities have been taken at large scales and with extreme care, and are such that the workman can work direct from them and secure exactly the same results or any desired modification. Your copy of this publication is ready for the mail—will you please write for it?

THE COMMON BRICK MANUFACTURERS' ASSOCIATION OF AMERICA
CLEVELAND ~~ OHIO

Armstrong's Linoleum

for Every Floor in the House



No. 350 Straight Line Inlaid

Blue Jaspé—Color No. 18

Field of Light Gray Jaspé No. 13 with Border of Black No. 27

No. 5064 Moulded Inlaid

COLOR OPPORTUNITIES IN FLOORS

THE new linoleum, "for every floor in the house," shown here is Armstrong's Jaspé, light gray, No. 13. Into the jaspés go varying tones of a single color, to produce this pleasing effect of dull jasper.

Jaspé linoleum in neutral two-tone grays is a good foundation for color schemes of living-rooms, dining-rooms, and bedrooms. How much more harmonious with tinted walls of pastel greens, for instance, or creams or blues or grays is this jaspé than floors of shiny yellow or monotonous brown!

You can add to the beauty and distinction of jaspé floors by surrounding them with borders. The plate pictures a border of black linoleum, color No. 27. Your decorative plan may call for a border of blue or green or plain dark gray. There are other jaspé colors, too—blue, green, dark gray, light brown, and dark brown. Thus you see the unusual color possibilities of the modern linoleum floor.

For the residence, apartment, office, business house, or public building, wherever you want color in the floors, you can use linoleum effectively and inexpensively. Send for "Armstrong's Linoleum Floors," an 8½ x 11-inch handbook of plates and specifications, to see the range of colorings and designs from which you may choose.

Armstrong Cork Company *Linoleum Division* **Lancaster, Pennsylvania**

Sherman, Texas,
High School

C. H. Page & Bro.,
Architects

Young, Allmon & Wood,
Gen'l. Contractors

The Acme Brick Structure Graces Its Environment!

THE Sherman, Texas, High School is a beautiful structure in a picturesque setting and graphically emphasizes the adaptability and pleasing appearance of Acme Brick for the modern school.

The Architects' ideal has been accomplished with Autumn Leaf "Rugg" texture shadings from our Bennetts, Texas, plant in harmony with the charming setting of majestic trees.

Make Our Display Rooms Your Workshop For Solving Color Schemes

The six big Acme plants are so located as to make possible the production of a most unusual range of colors of weather-proof quality to render any color scheme.

A visit to our display rooms undoubtedly will prove both pleasant and profitable.

ACME BRICK COMPANY
Manufacturers
General Offices, Fort Worth, Texas

ACME BRICK

Offices and Display Rooms:

Amarillo, Texas
Beaumont, Texas
Dallas, Texas
Fort Smith, Arkansas
Fort Worth, Texas
Houston, Texas
Little Rock, Arkansas
Memphis, Tennessee
New Orleans, Louisiana
Oklahoma City, Oklahoma
Port Arthur, Texas
Shreveport, Louisiana
San Antonio, Texas
Tulsa, Oklahoma
Waco, Texas
Wichita Falls, Texas

Plants (Owned and Operated)

Bennetts, Texas. Cleveland, Oklahoma. Denton, Texas. Fort Smith, Arkansas. Oklahoma City, Oklahoma. Perla, Arkansas

Annual Capacity Over 100 Million Face Brick

LIBERTY BUILDING ~ DES MOINES ~ IOWA

Appalachian Marble in Des Moines

Appalachian Tennessee Marble is used for interiors, such as that of the Liberty Building, of Des Moines, Iowa, not alone because of its permanency, but because it can be obtained in a wide variety of colors.

With Appalachian marble, it is as easy for the architect to exactly carry out his interior marble color scheme as it is for an artist to select from his palette the colors for a picture.

Appalachian Tennessee marble is shipped at commodity rates from Knoxville and is reasonable in cost because its huge production is obtained by time and labor saving quarrying and milling methods, and the utilization of all waste. The result is that the many colors of Appalachian marble are used in Iowa and all other states, in Canada, in Europe and in South America.

Architects are invited to make use of the Appalachian corps of experienced interior marble engineers. Plans and specifications sent for accurate cost estimate entail, of course, not the slightest obligation, and receive prompt attention.

APPALACHIAN MARBLE COMPANY

KNOXVILLE - *Producers exclusively of Sincere Marble* TENNESSEE

PINK Georgia Marble being distinctly different, is impressive with its warmth and dignity. The exterior and statues are of this material. Hardness, durability, and lack of absorption are outstanding characteristics of Georgia Marble.

THE GEORGIA MARBLE COMPANY

TATE, GEORGIA

NEW YORK
1328 Broadway

ATLANTA
804 Bona Allen Bldg.

CHICAGO
456 Monadnock Bldg.

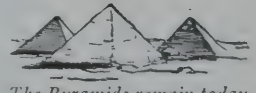
Terre Haute Trust Co. Building, Terre Haute, Indiana,
Remodelled.
Weary & Alford, Architects.

Terre Haute Trust Co.
Building,
Terre Haute, Indiana,
before remodelling.
Vonnegut & Bohn,
Architects.

Build with Indiana Limestone and Avoid Future Expense

ARCHITECTS and builders who specify Indiana Limestone at the time when their plans are first being drawn, are safeguarding themselves against later disappointments which arise from the use of substitute products. Inferior materials eventually prove unsatisfactory and building owners find it advisable to remodel, which necessitates considerable expense.

The Terre Haute Trust Company is one of the many other organizations throughout the country that has recently replaced an inferior material in their building with Indiana Limestone, thereby greatly improving the appearance of the structure, and assuring themselves of lasting satisfaction. Indiana Limestone is practically immune to the action of frost, moisture, and other destructive elements, and is *permanently* beautiful and sound.



The Pyramids remain today as permanent evidence that limestone is the world's most enduring building material.

The latest addition to the Indiana Limestone Library, a booklet showing some of this country's finest Indiana Limestone school and college buildings, will be sent free upon request. Address, Indiana Limestone Quarrymen's Ass'n., Box 766, Bedford, Indiana

BUILD THE NATION SECURELY WITH

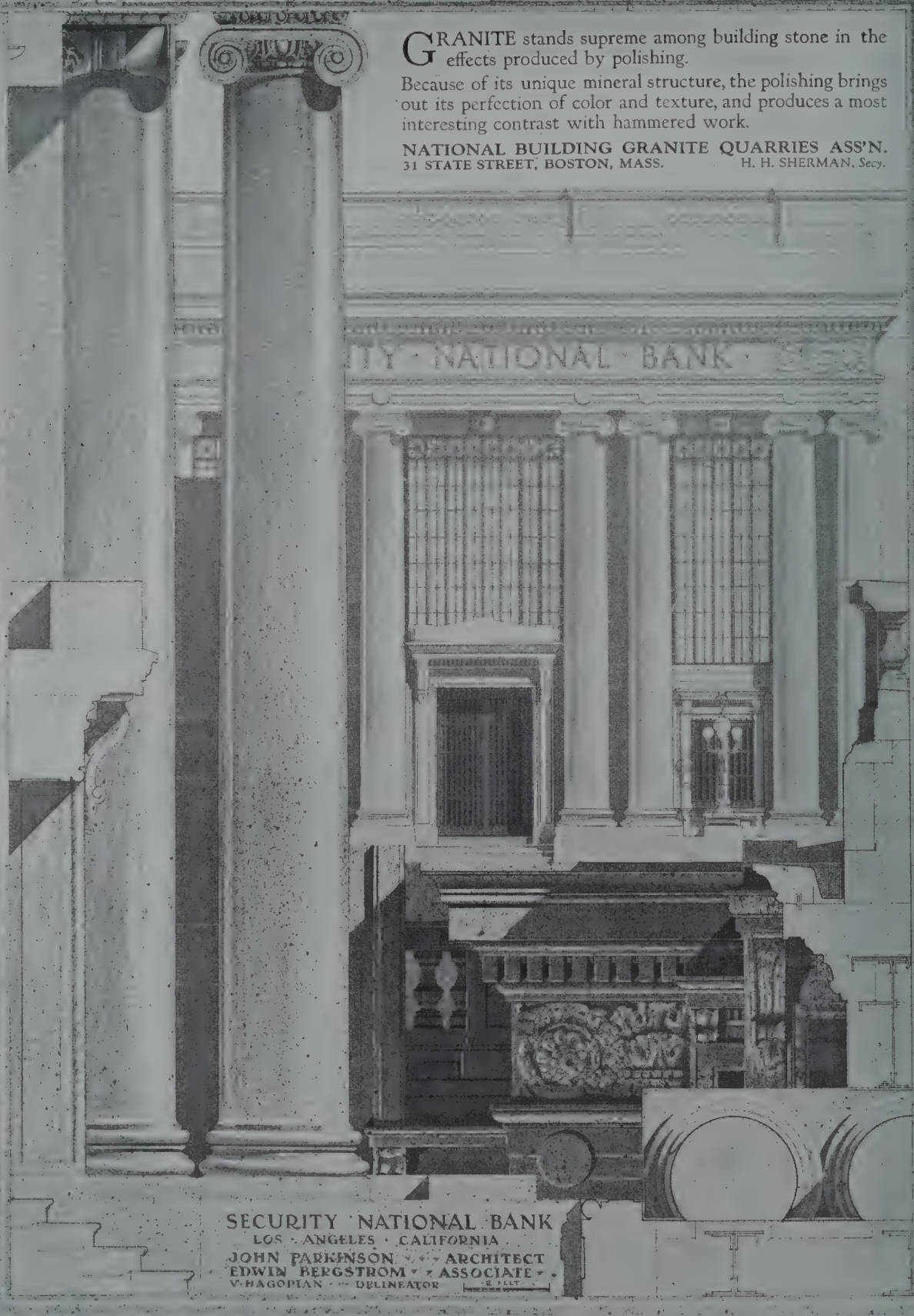
INDIANA LIMESTONE

The NATION'S BUILDING STONE

GRANITE stands supreme among building stone in the effects produced by polishing.

Because of its unique mineral structure, the polishing brings out its perfection of color and texture, and produces a most interesting contrast with hammered work.

NATIONAL BUILDING GRANITE QUARRIES ASS'N.
31 STATE STREET, BOSTON, MASS. H. H. SHERMAN, *Secy.*



SECURITY NATIONAL BANK
LOS ANGELES CALIFORNIA
JOHN PARKINSON ARCHITECT
EDWIN BERGSTROM ASSOCIATE
V. HAGOPIAN DELINEATOR

STVDIES IN GRANITE PLATE XVI

On Request a complete folio of these Granite Studies will be reserved for you.

CARNEY
for Brick and Tile Mortar

The Strength of Carney

TWO years ago Carney was specified and used for laying up the brick, tile and terra cotta in the first great section of the Wrigley Building, Chicago.

When making the openings in the old section for joining the new North Section recently completed, it was found the Carney mortar had so hardened and the bond was so strong it was necessary to crush the brick.

Such a convincing and striking proof of the strength and quality of Carney naturally induced the builders of the new North Section to specify and use it again in that structure.

So the entire Wrigley Building stands completed today a lasting monument to the strength, durability and economy of Carney.

Carney is the perfected cement for brick and tile mortar.

The Carney Company

Cement Makers Since 1883

Mankato, Minn. Mills at Mankato, Carney, Minn.

District Sales Offices: Leader-News Building, Cleveland; Chamber of Commerce Building, Chicago; Omaha National Bank Bldg., Omaha; Syndicate Trust Building, St. Louis; Book Building, Detroit; Builders' Exchange, Minneapolis.

Specifications: 1 part Carney to 4 parts sand.

WRIGLEY BUILDING, CHICAGO, ILL.
Architects: Graham, Anderson, Probst & White, Chicago, Ill.
Contractor: Lanquist & Illsley Co., Chicago, Ill.

Permanent roads are a good investment —not an expense

Road Building Far Behind the Automobile

Millions now recognize the automobile as a necessity. It is no longer a luxury for the few. Sixty per cent of its use is for business.

Because of this the modern paved highway has become an economic necessity.

Yet although the mileage of Concrete Roads and Streets has been steadily increasing, our highway system today lags far behind the automobile. The great majority of our highways are as out of date as the single-track, narrow gauge railway of fifty years ago.

Such a condition not only seriously handicaps the progress of the automobile as a comfortable, profitable means of transportation, but also holds back commercial, industrial and agricultural advancement in practically every section of the country. It is costing taxpayers millions of dollars annually.

Highway building should be continued and enlarged upon.

Your highway authorities are ready to carry on their share of this great public work. But they must have your support. Tell them you are ready to invest in more and wider Concrete Highways now.

PORTLAND CEMENT ASSOCIATION

A National Organization to Improve and Extend the Uses of Concrete

Atlanta	Dallas	Jacksonville	Minneapolis	Parkersburg	San Francisco
Birmingham	Denver	Kansas City	New Orleans	Philadelphia	Seattle
Boston	Des Moines	Los Angeles	New York	Pittsburgh	St. Louis
Charlotte, N.C.	Detroit	Memphis	Oklahoma City	Portland, Oreg.	Vancouver, B. C.
Chicago	Indianapolis	Milwaukee		Salt Lake City	Washington, D.C.

BRIXMENT

for Perfect Mortar

Columbian Mutual Life Insurance Building, Memphis, Tennessee. BRIXMENT mortar used on all brick and hollow tile. Boyer & Baum, St. Louis, Architects; Keeley Bros. Contracting Co., St. Louis, Contractors; B. Lyons, Memphis, Tennessee, Masonry Contractor.

Strength, durability, economy

The invariable strength of BRIXMENT mortar insures a joint as strong as the brick itself. Resists moisture, will not scale, pop or otherwise disintegrate. Retains mortar colors permanently without impairment. No lime, no slaking. Can be used immediately after mixing [1 part BRIXMENT, 3 parts sand]. Because of its inherent oily plasticity, BRIXMENT mortar can be laid with greater ease and economy. Further details and list of BRIXMENT buildings sent on request.

LOUISVILLE CEMENT CO., Incorporated SPEED BLDG., LOUISVILLE, KENTUCKY

FROM Tivoli, in the Sabine Mountains, Earl Horter sends an interesting drawing of the crumbling remains of ancient Roman temples.

Here is a drawing which will appeal to everyone who knows the charm of penciling. Studying the technique, analyzing the character of the drawing, it is not difficult to see why Earl Horter, even in Europe, invariably uses the Dixon's Eldorado Pencil.

SAMPLE OFFER—Write for full-length free sample of "the master drawing pencil" and of Dixon's *"Best"* Colored Pencils. In their field, the *"Best"* Colored Pencils hold the same position of supremacy as Dixon's Eldorado.

JOSEPH DIXON CRUCIBLE COMPANY
Pencil Dept. 224-J, Jersey City, N. J.
Canadian Distributors, A. R. MacDougall & Co., Ltd., Toronto

SARGENT
HARDWARE

NATIONAL ACADEMY OF SCIENCES
WASHINGTON, D. C.

BERTRAM GROSVENOR GOODHUE
Architect

Their use in a monumental public building of this character, where both the utilitarian and the artistic must be considered, is evidence that

SARGENT
Locks & Hardware

conform to the high standard set by the architect.

It is another addition to the long list of notable structures in which the products of the Sargent factories are used.

SARGENT & COMPANY

NEW HAVEN, CONN.

NEW YORK, 94 Centre Street CHICAGO, 221 W. Randolph Street

"Details to which Standard Hardware can be applied" are printed in our catalogue. We have additional copies of these pages, bound with a cover, that we shall be pleased to send to Architects and Architectural Draftsmen upon request.

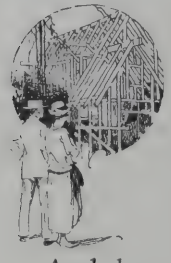
When you design their "little house o' dreams" — *let not the last be least*

ONCE upon a time not so very long ago, Jack and Mrs. Jack planned a cozy house high upon a hill—the kind we all hope to have some sunny day.

They talked things over well—joyously discussed their future home into the wee sma' hours. One day they proudly viewed the finished plans. They were *good* plans for a *good* home—what one expects and gets from a *good* architect.

And so, the work began. Day by day the house arose in all its beauty—nearer and nearer came the completion of their happiness. At last they stood on the hill and viewed their "little house o' dreams"—created.

* * *



They had dug deep in the ground and deep in their pockets for a *good* foundation. They had raised an extra loan to raise a *good* roof. They had hotly insisted on having a *good* heating plant. And plumbing? "Of course we want *good* plumbing" was their answer.

And then one day, they came to the last thing on the list, and being last they thought it least—the hardware. They thought "we'll save on the hardware—it's not so important." To the admonitions of their architect they answered "No". To the experience of their contractor they lightly snapped a finger.

Now listen closely that you may know what happens when the last is made least—when *good* buildings fail to get *good* hardware.

The doors were hung with two light hinges. They deserved three sturdy *good* ones. After awhile, the doors began to sag and squeak and stick—a daily irritation.

The locks—they looked about the same as *good* hardware. Poor locks often do—outside. But later their insides told a different story. They simply didn't work without a fuss. The key would stick. The knobs came loose and horror of horrors, the bright brass passed away. Rust and worn spots took its place.

The windows—what difference does their hardware make? Ask Jack and wife. They can tell you much about the ill-temper of cheap pulleys—their flat refusal to raise and lower windows quietly, easily and obediently. And makeshift window lifts that tarnish; fasteners, that with a struggle, only partly fasten.

And all through the house you will find it the same.

Those lovely casement windows that stick—the tall and gracious French doors that sag—the cabinet doors that keep forever slyly opening—all so beautifully designed, yet a daily disappointment and aggravation because of hardware on which Jack and wife decided "to save a bit."

* * *

To every sad story, there is a happy moral which you have no doubt guessed—which Jack and Mrs. Jack could now recite so well.

It is—"Good Buildings deserve Good Hardware—Corbin".

True—isn't it? So obviously true that we wonder why well meaning Jacks and wives fail to realize it until after they have finished building.

Hardware that works willingly, doors that smoothly swing but never sing, locks that say "shut" and stay shut, windows that gladly rise on any occasion.

Yes, *good* hardware—Corbin—serves silently and satisfactorily as do well trained servants.

When you come to the last, let it not be least in their "house o' dreams". If it is to be a *good* building, it deserves *good* hardware—Corbin—nothing less.

Our interesting booklet "Good Buildings Deserve Good Hardware" should be read by every client who is building or thinking of it.

Good Buildings Deserve Good Hardware

P. & F. CORBIN
SINCE 1849
The American Hardware Corporation Successor

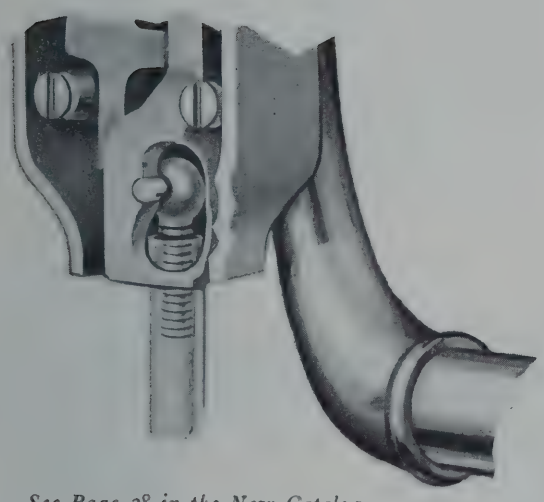
CORBIN

NEW BRITAIN, CONNECTICUT
New York · Chicago · Philadelphia

Von Duprin

TRADE MARK REG. U.S. PATENT OFFICE

Self-Releasing Fire Exit Latches



See Page 28 in the New Catalog

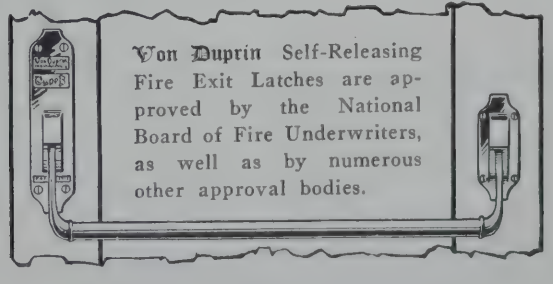
When the Door Warps

One of the great difficulties of self-releasing panic devices of the older types having vertical rods, lay in the top and bottom latches refusing to operate when the doors warped or shrank.

In the new model **Von Duprin** latches this difficulty is entirely overcome by the patented ball compensating device shown in the illustration.

This simple device permits the distortion of the vertical rods out of the plane of the mechanism case without interfering in the slightest with the positive, easy action of the device. It is one of the important improvements which make **Von Duprin** latches reliable at all times, even under panic conditions.

This is the seventh of a series of announcements showing recent improvements in **Von Duprin** *devices.*



VONNEGUT HARDWARE CO.

Indianapolis, Indiana

Manufacturers

Von Duprin *devices are made better than is necessary for every day service: they are made to work perfectly under emergency demands—to save lives!*

THE
PREMIER ARCHITECTURAL
NEWSPAPER
with the largest SALE in the
British Isles among
ARCHITECTS
IS

"THE BUILDER"

A JOURNAL FOR THE
ARCHITECT and CONSTRUCTOR
Every Friday *Price 9d.*
Established 1842

First in News Finest in Illustrations
Large double and single page inset plates

SPECIAL OXFORD NUMBER
Numerous views and sketches of Oxford
Mediæval Oxford with key — Large double page plate by the late H. W. Brewer
by post 1/2

LIVERPOOL CATHEDRAL NUMBER
4 loose double page inset plates including a special drawing by T. Raffles Davison. Liverpool Cathedral—view of the completed scheme.
By post 1/2.

ROYAL ACADEMY NUMBER
40 pages of plates—Architectural works exhibited at the Royal Academy, 1924. By post 1/3.

"THE BUILDER" will be sent you weekly for 12 months for £2/5/-.

"THE BUILDER" Architectural Series of Books
Modern Bungalows—post free 1/3d.

Houses with 3 and 4 Bedrooms—post free 2/11d.
A selection from the Designs sent in for "THE BUILDER" Cost of Building Competition.

Wren's City Churches
A series of Pencil illustrations specially drawn by T. Raffles Davison Hon. A. R. I. B. A. 2/11d.

"Old London Illustrated"

WITH
TRANSPARENT KEY PLATES AND INDEX
Post free 8/-

LIST OF ENGRAVINGS: The City of London (*Dbl. page*), The Tower of London, Aldgate, Old St. Paul's (The Nave, East End, North Aisle), Cheapside, Ludgate, Newgate, Ely Place, Old London Bridge, Westminster (St. Stephen's Chapel), and Transparent Key Plate for each Picture.
Bound in cloth boards.
The drawings are printed on one side of the paper only.

A full list of Books for the Profession and specimen copy of "THE BUILDER" sent post free on request.

THE BUILDER, LTD.
4 Catherine Street, Aldwych
London, England

CLIP THIS FOR YOUR SECRETARY TO FILE

THE WALL OF CHINA
MODERN OFFICE

Once
MADE BY THE MILE

GENERATIONS of toiling coolies piled stone into the great Wall of China—legendary marvel of a former age.

The wall of Mount-Partition—marvel of the present business age—has equalled the length of the Wall of China in 32 years—1800 miles! Its perfected adaptability to all business allows the architect to specify a standard by which local builders or carpenters can duplicate our famous New York service.

MADE BY THE MILE
Reg. U. S. Pat. Off.
SOLD BY THE FOOT

Examination of a miniature Mount-Partition shows how the patented pin locks two sections rigidly — without screws or fastenings. *Shipped on request.*

MOUNT
PATENTED
LOCKT
OFFICE PARTITIONS

Inquire concerning our specialized ability to serve you and send for our list of clients

MOUNT & ROBERTSON, *Inc.*
Established 1892
41 Beaver Street, New York

"The HIGGINS' Triangle"

Drawing Board Paste-Drawing Ink-Photo Mounter
Used by Most Architects for over 40 Years

CHAS. M. HIGGINS & CO.
271 Ninth Street Brooklyn, N.Y.
CHICAGO LONDON

Meets All Architectural Requirements

This Hollow Steel Standard Unit Partition at Wood Cost

AT LAST! a hollow-steel, interchangeable partition of standard units!

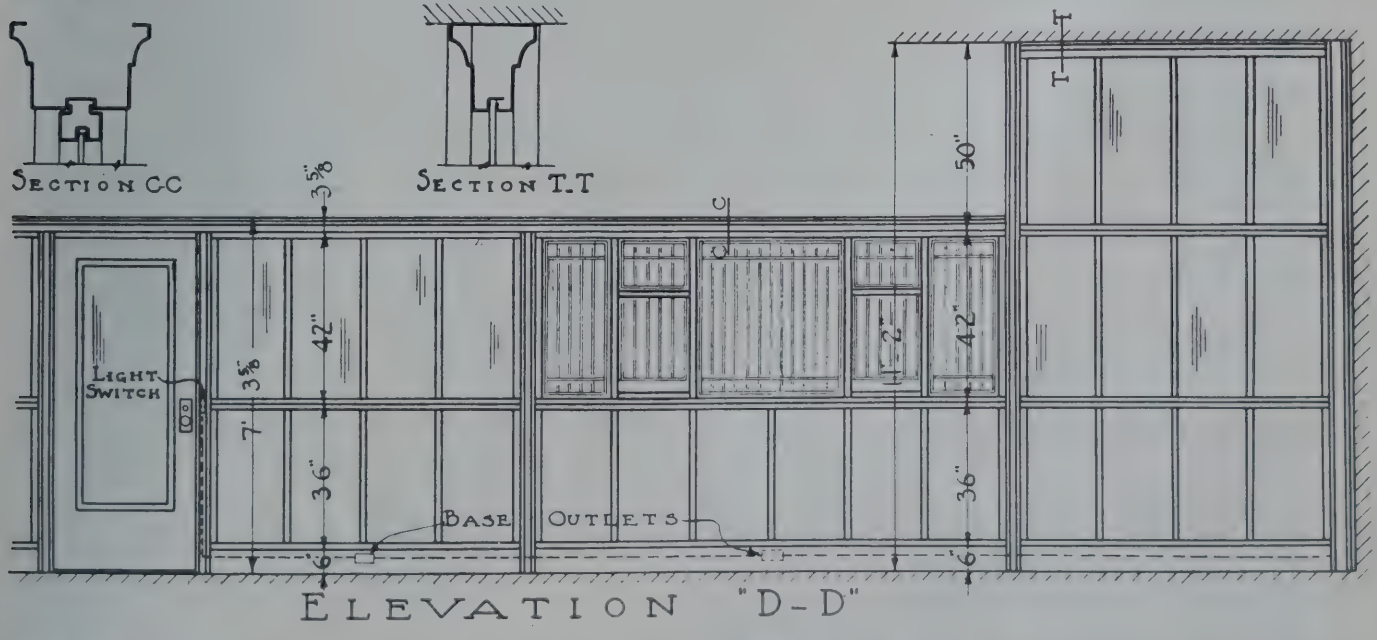
A well balanced design so skilfully followed that it is suitable for use in the finest banks, offices and schools as well as shops. A rich, warm color—Hauserman Brown—that tones in, and blends with all surroundings.

Hauserman Standardized Partitions offer your clients many advantages. Adaptable to any height, width or condition. Any desired combination of doors, wickets, grills or ventilators. Easy to re-arrange or add to, at any time with 99% salvage. Strong, rigid, fire-resisting.

Quick shipment from stock. Obtainable at wood cost. Let us plan with you.

THE E. F. HAUSERMAN COMPANY
1733 East 22nd Street Cleveland, Ohio

BRANCH OFFICES
New York Boston Pittsburgh Detroit Chicago



ELEVATION "D-D"

HAUSERMAN PARTITIONS

Hollow Steel-Standard Units at Cost of Wood

Dignity Befitting Any Office

CIRCLE A PARTITIONS (Sectional and Removable) create a satisfying impression of stability and permanence. Not a screw-head or a bit of wiring shows. Joints are accurately machined. Nothing indicates that the structure can be taken down in a few hours' time.

Circle A Partitions offer the office a beauty of finish and tone that plaster can never possess. You have your choice of mahogany, oak, birch, or pine from stock; and to order, gum or walnut. The finish can be made to match other woodwork or furniture.

Below is shown an installation of Circle A Partitions, Cabinet Design, in solid mahogany, in the American Furniture Mart, Chicago. The members of the furniture trade and the manufacturers who use this building are critical judges of cabinet work.

Send for complete catalogue showing details, plans, construction, etc., of Circle A Partitions, mailing to us the coupon below.

CIRCLE A PRODUCTS CORPORATION
A Subsidiary of The Alexander Lumber Co.
Makers of Circle A Portable Houses and Churches
Portable Bleachers, etc.
714 Neil Street, Champaign, Illinois

TEAR off this coupon and send for complete illustrated catalogue, file size, showing details of construction, floor plans, etc.

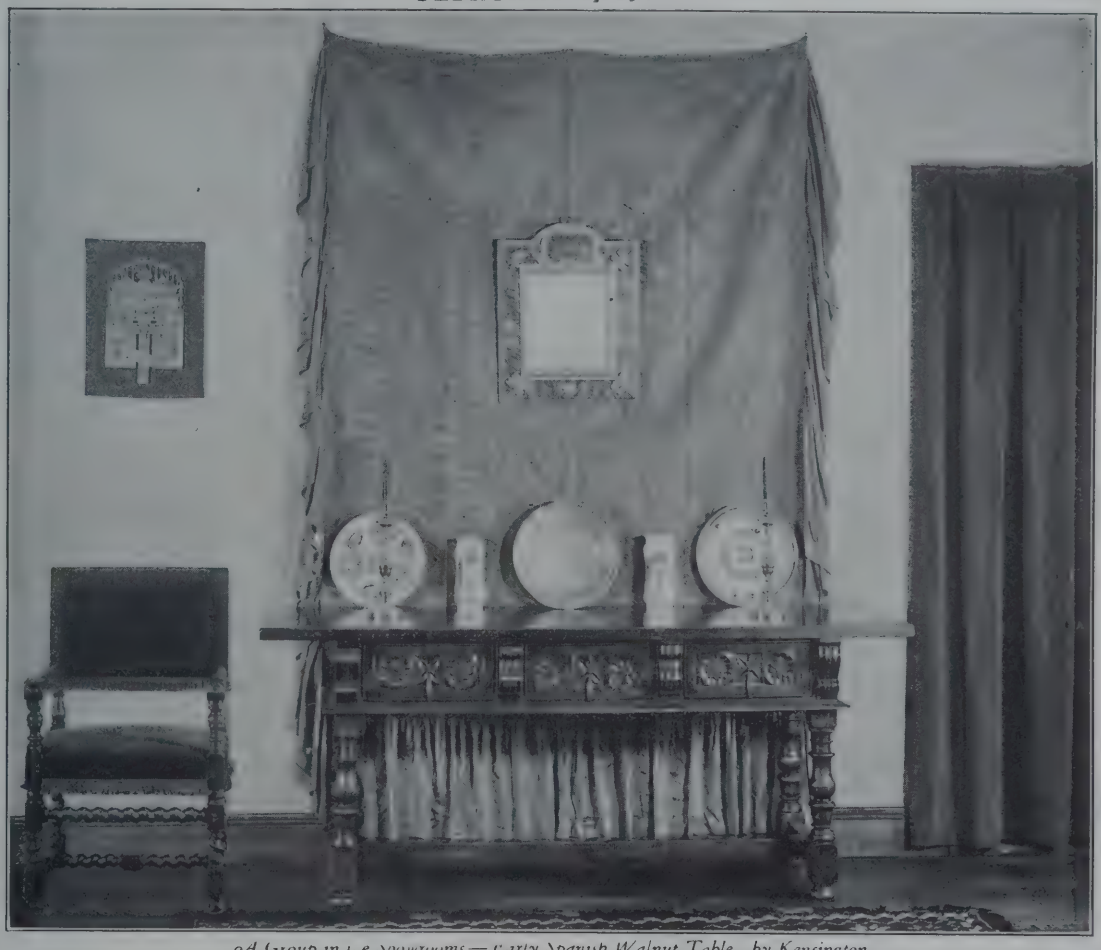
_____

_____

_____

KENSINGTON FURNITURE

AWARDED GOLD MEDAL OF HONOR IN NATIVE INDUSTRIAL ART
39TH ANNUAL EXHIBITION ARCHITECTURAL LEAGUE OF NEW YORK
FEBRUARY 1, 1924



A Group in the Showrooms — Early Spanish Walnut Table by Kensington

THE growing interest in the furniture and decorative art of Old Spain is a natural result of the trend in America toward simplicity and freedom in home surroundings. We are coming to share the Spaniard's appreciation of the restfulness of plain wall surfaces and their value as a background for fabrics and furniture.

Early Spanish furniture (Mudejar), the work of Moorish craftsmen, is a fascinating blending of the richness of Renaissance Italy with the simplicity of the Arab. The frank directness of its construction and ornament gives it an extraordinary vitality and a decorative quality that is brilliant yet essentially simple in character.

Fidelity in design and the old-time hand processes of the Kensington craftsmen retain in Kensington reproductions the character and the decorative quality that are the charm of the antique.

Architects interested in completing the interiors they design with furnishings harmonious in both character and quality are cordially invited to avail themselves of the service of the Kensington Showrooms and staff.

Illustrated Booklet F sent on request

KENSINGTON MFG. COMPANY
MANUFACTURERS AND IMPORTERS
DECORATIVE FURNITURE ~ ART OBJECTS
NEW YORK
NEW SHOWROOMS, 41 WEST 45th STREET, 6th FLOOR

K-C

KENT-COSTIKYAN

FOUNDED 1886

485 FIFTH AVENUE—SIXTH FLOOR
Opposite Public Library

NEW YORK

IMPORTERS OF ANTIQUE AND MODERN RUGS
FROM PERSIA, INDIA AND THE FAR EAST

SMALL RUGS AND STRIPS IN GREAT VARIETY

In the selection of choice Oriental rugs we advise the
co-operation of a decorator or architect

Memorial Pulpit, Grace Cathedral, Topeka, Kansas
A Product of our Wood Carving Studios

Church Furniture

ALTARS · PULPITS · LECTERNS
BAPTISMAL FONTS
CHOIR STALLS · PRIE-DIEUX
ALTAR RAILINGS
ORGAN SCREENS · ROOD BEAMS
READING DESKS
MEMORIALS IN CARVED WOOD
PEWS · CHAIRS

American Seating Company

General Offices
1094 Lytton Building
CHICAGO

NEW YORK
620—119 W. 40th St.

BOSTON
79 Canal Street

A Small Business Building that Reflects Architectural Skill

Beauty and harmony of architectural treatment are clearly revealed in the administrative building of the Restrick Lumber Company, inside as well as out. The floors of Gold-Seal Treadlite Tile, for instance, were selected for their artistic appearance as well as for their practical qualities.

Artistic, appropriate floors are a specialty of the Bonded Floors Company, and there's a particular Bonded Floor for office, salesroom, store, shop, club, church or private residence. For one of these interiors, the right floor and pattern may be one of Gold-Seal Treadlite Tile or Gold-Seal Rubber Tile. For another, Gold-Seal Battleship Linoleum—a sturdy, durable floor which satisfies every practical demand, including low cost.

We will gladly send complete information on any or all types of Bonded Floors; the Surety Bond; and specifications covering the installation of resilient floors.

Exterior and lobby of Restrick Lumber Company's office building, Detroit, Mich. Architects: Abraham & Wood.

Gold-Seal Treadlite Tile (illustrated above) is a resilient cork composition floor of contrasting tiles firmly cemented to the floor. Durable, waterproof, and easy-to-clean, it is only one of the variety of forms in which Bonded Floors are available.

Every Bonded Floor is an individual problem, worked out to suit the interior in which it is installed.

Backed by a Bond

Every floor laid according to Bonded Floors specifications is backed by a Surety Bond issued by the U. S. Fidelity and Guaranty Company. The bond insures freedom from repair expense due to defects in materials or workmanship.

BONDED FLOORS COMPANY, INC

Division of Congoleum-Nairn Inc.

Manufacturers · Engineers · Contractors

Main Offices: 1421 Chestnut Street, Philadelphia, Pa.

New York · Boston · Philadelphia · Cleveland
Detroit · Chicago · Kansas City
San Francisco · Los Angeles

(Distributors in other principal cities)

LOUIS L. ALLEN
Antiques

An interesting Hepplewhite set consisting of two arm chairs as illustrated above and four side chairs.

ONE fascination of the antique is the speculation which it arouses as to its origin and history. Some of our pieces have a well-defined past. Concerning others, however, very little is known. In every instance, however, we vouch for their authenticity.

521 MADISON AVENUE
Between 53rd and 54th Streets
NEW YORK

The Genre Designs of an Old French Needlepoint *are reproduced in this Tapestry Covering*

Like its original, this tapestry, a reproduction of an antique French needlepoint, is filled with animated vignettes

INTERWOVEN with homely humor and acute observation, replete with popular anecdote from edge to edge, the genre tapestries of the 17th and 18th centuries have a variety of interest that makes them unique not only among tapestries but among all decorative textiles.

This fine modern tapestry recreates the same abundant and interesting forms which patterned a superb antique French museum piece. The original was done not on a tapestry loom, but in the still older fashion of needlepoint. The modern replica shows the tiny, charming figures of the original, mountebanks of old French countrysides with their dancing bear and fortune-telling bird. Flying insects, peacocks in pursuit, richly filling every space, are all framed and held into the composition by a winding ribbon suggestive of a Chinese cloud-band.

Like the original, it records in soft wools and reds and yellows of primitive freshness the rise of democratic taste. Far from mediaeval themes of chivalry, from the sumptuous classicism of the Renaissance, it faithfully follows the example of the peasant scenes later popularized by Teniers and Goya.

While this tapestry contains all the merits and charm of the original, modern developments in textile weaving have made it quite available for today's interiors. Other tapestries representing the genre traditions of France, of Flanders, and of Spain are in the Schumacher collection, while the whole range of tapestries, reproducing the best of the great periods, is unusually comprehensive.

Dealers and decorators will find in the Schumacher establishment a wide variety of fabrics suitable to all types of interiors.

F. Schumacher & Co., Importers, Manufacturers, Distributors to the trade only of Decorative Drapery and Upholstery Fabrics, 60 West 40th Street, New York. Offices also in Boston, and Chicago, and Philadelphia.

F-SCHUMACHER & CO.

The New Model "C" Fain Fold-Away Breakfast Room

The Junior member of the family of Fain Fold-Away Units has, by its compactness, comfort and adaptability, won the interest of architects and builders the country over. It sets in a standard four-inch stud partition.

PRICE $50 F.O.B. NORFOLK, VA.

Write for Illustrated Folder and Details

FAIN MANUFACTURING CO.

313 National Bank of Commerce Building
NORFOLK, VIRGINIA

The entire ideas of the Fain FOLD-AWAY Dining and Breakfast Rooms are protected by U. S. Patent Laws.

Agents Wanted in Several Cities

TODHUNTER

414 Madison Avenue
New York

A rare type of
Georgian Dog Grate

[*Part of a collection of unusual pieces illustrated in our booklet, "Gleanings From Old English Firesides," sent upon request.*

Design in Wall Paper

SAID "Arts and Decoration" recently: "The reaction of architects and decorators—and consequently of the public as well—toward plaster finishes and plaster panel effects for walls was a reaction *not against wall paper but against bad design.*"

The italics are ours, because we want to emphasize again the point we have always stood for, namely: the most pleasing, colorful and harmonious way to cover walls is to use wall paper, provided it is artistically designed and faithfully executed.

Write for samples or send your clients to our showrooms.

W. H. S. *Lloyd* CO.

Importers of Wall Papers of the Better Sort

NEW YORK — 105 W. 40th Street
CHICAGO — 310 N. Michigan Avenue

In a Spanish Castle in Cleveland Heights

The MURPHY IN-A-DOR BED

TWO hundred feet above Lake Erie, Cleveland has an apartment hotel of which she is justly proud. The Alcazar, a Spanish Castle in realization as well as in translation, has a total of 300 rooms [all outside] which form a nucleus of approximately one hundred suites.

225 Murphy In-A-Dor Beds give such flexibility to the entire floor scheme that it may be arranged to suit the guests in suites of a single room and bath up to those of five or six rooms.

Over 200 of the Murphy Beds in the Alcazar are of the twin type. By day they are out of sight and out of the way in their bed closets. At night they swing easily in position, turning the living room into a sleeping chamber. Murphy Beds are the only standard, full size beds that are effectively concealed by a standard 3-ft. door.

GEO. W. HALE, Owner
H. T. JEFFERY, Architect
H. D. HUGHES, Consulting Architect

The Alcazar from the inner court.

The very fact that such hotels as the Alcazar are planned and built to include the Murphy Bed testifies to its reputation as a bed that brings comfort to the guest who sleeps upon it, years of sturdy service to the owner who installs it and the gratitude of both to the architect who, by recommending it, made it possible for them to enjoy the convenience of an extra bedroom without extra building cost or extra household care.

THE MURPHY DOOR BED COMPANY

Offices and Display Rooms in all Principal Cities

22 West Monroe Street, Chicago. 1534 Blake Street, Denver. Crocker Bldg., San Francisco. 1140-42 Hanna Bldg., Cleveland. 204 Peach Tree Arc., Atlanta, Ga. Chemical Bldg., St. Louis. 1410 Kresge Bldg., Detroit, Mich. Terminal Sales Bldg., Seattle. 1114 Grand Ave., Kansas City. 469 Fifth Ave., New York City. 220 N. St. Paul St., Dallas, Texas. 309 Third Ave. N., Nashville. 1807 S. Main St., Los Angeles. Neff-Stiles Bldg., El Paso. 319 Dryades Street, New Orleans. 10 St. Antoine Street, Montreal, Can. 205 O'Connor Street, Ottawa, Can.

Looking into the patio through an archway of the loggia which surrounds it on three sides.

Detail of the loggia where it leads from the patio into the hexagon-shaped lobby.

THERE IS ONLY ONE IN-A-DOR BED—"THE MURPHY"

A BANKERS' BOARD ROOM
with well finished
Mahogany Pannelling and Furniture
Harmonious and Dignified

BE SURE IT IS GENUINE MAHOGANY

We welcome every opportunity to confer with you on all matters relating to this subject.

MAHOGANY ASSOCIATION, INC., 1133 Broadway, New York

A NATIONAL ORGANIZATION *of* MAHOGANY PRODUCERS

Cotton Exchange, New York City
American Walnut
Donn Barber, Architect

IN this world mart of commerce, the Architect selected Woodwork by Matthews Brothers to carry out his conception of the service of this institution and the grandeur of a great nation expressed in his design.

Since eighteen hundred fifty-seven, architects have universally selected Woodwork by Matthews Brothers for interiors in which dignity and beauty were the first consideration.

Matthews Brothers Manufacturing Company, *Inc.*, Milwaukee, Wisconsin

WOODWORK *by* MATTHEWS BROTHERS

View of Morrowfield Apartment Hotel, Pittsburgh, Pa., and twelve of the thirty-two Brunswick Alleys that comprise its bowling facilities.

FACILITIES for healthful, invigorating indoor recreation are essential to the successful operation of Hotels, Apartment Buildings, etc. They make the property more attractive to guests and tenants. They augment rental values. They enhance the income derived from the total investment.

As makers of the world's finest equipment for billiards and bowling, we are in a position to render valuable assistance in planning billiard rooms and bowling alleys for such enterprises. A letter to our home office will enlist our fullest cooperation without in any way obligating architect or owner.

The BRUNSWICK-BALKE-COLLENDER *Company*

Branch houses in the principal cities in the United States and Canada

623-633 South Wabash Avenue, CHICAGO

billiards

a gentleman's game

The wallpaper design reproduced in this panel is one-tenth actual size.

WALLPAPER effects removed from the conventional may be obtained readily without sacrifice of taste or beauty. The example given here is one of the most ambitious and pleasing of the newer creations. Modern in every sense of the word, it gives to the dining room the lovely freshness of a hanging garden.

Equally beautiful wallpapers of authentic pattern for every historical period or decorative style may be obtained.

Write to our Interior Decoration Service Bureau for practical co-operation in supplying architects samples of wallpaper and other aids to the solution of specific problems in the decoration of walls.

Any store that displays this sign is an associate member of the Wallpaper Guild.

WALLPAPER

MANUFACTURERS ASSOCIATION *of the United States* 461 EIGHTH AVE., N. Y. C.

"The Marquis Was Speechless

"—Nothing more magnificent and more refined at once had ever met his gaze. On the four principal panels were the arms of the Du Barrys, with the famous war-cry, 'Boute en avant.'

"Upon each of the side-panels was a basket of roses on which two doves were tenderly pecking at each other, the whole varnished with the Martin Varnish, the secret of which is lost now.

"The carriage cost fifty-six thousand francs.

"'Has the king seen the superb gift, Madame la Comtesse?' asked the Marquis de Chauvelin.

"'Not yet, but I am sure of one thing.'

"'Of what are you sure? Let us hear.'

"'That he will be charmed with it.'"

Extract from "MONSIEUR De CHAUVELIN'S WILL" by Alexander Dumas, (Handy Library Edition), Copyright 1897.

Martin's 100% Pure Varnish

is today manufactured of Pure Gums, Pure Oil, and Pure Turpentine—No Rosin—No Benzine. Because of these quality ingredients Martin's 100% Pure Varnish gives a finish that cannot be excelled.

We make no secret about the ingredients used in the manufacture of Martin's 100% Pure Varnish. Because of this fact we are putting the formula on every package so that you and your customers *will know* what you are buying. This formula is your protection—a guarantee of a quality finish—economy and durability.

MARTIN VARNISH CO

PIONEERS OF 100% PURE VARNISHES

CHICAGO

HOTEL KANSAN, TOPEKA, KANSAS

Architect, Shepard & Wiser; *Painter,* G. C. Doering

AS America builds for permanency, architects in increasing numbers are specifying Berry Brothers' fine wood and metal finishes because they are best qualified, on the basis of low cost per year of service, to render enduring satisfaction.

BERRY BROTHERS INC.

Varnishes Enamels Stains

Walkerville, Ont. Detroit, Mich.

FRENCH'S PEERLESS MORTAR COLORS

Write us for Descriptive Booklet and Color Card, the Original PULP Mortar Colors

Samuel H. French & Company

PHILADELPHIA

Established 1844 **Incorporated 1920**

The Devonshire
McNally & Quinn - Chicago
Architects & Engineers
Devoe Varnish used throughout

Each Devoe Varnish is a Specialist!

Pale Interior
for interior upright surfaces

Marble Floor Finish
for floors and linoleums

Vernosite
for exterior use

Aquaspar
for all surfaces requiring special protection from water

Rubbed Effect
for producing a rubbed effect without hand rubbing

NO single varnish can suit all purposes equally well, no more than the same medicine can cure all ills. That is why Devoe has always sponsored "A particular varnish for a particular purpose."

Behind this plan is a plain common sense idea. Each Devoe Varnish is specifically compounded to meet the exact requirements of its particular use. This eliminates the sacrifice of one quality for the sake of another.

In making Devoe Varnishes there is no attempt to achieve quick drying at the expense of durability; or elasticity at the cost of clarity. Each varnish is made to do a specific thing as thoroughly and well as that thing can be done.

And each Devoe Varnish does its allotted task as beautifully and as thoroughly as 170 years' experience can help to do it.

New York DEVOE & RAYNOLDS CO., Inc. Chicago

Founded 1754

DEVOE

Paint and Varnish Products

THE OLDEST, MOST COMPLETE AND HIGHEST QUALITY LINE IN AMERICA

Residence of Dr. L. E. Leavenworth, Canton, Ohio

The Test of Painting That Comes with Winter's Snows

WITH the coming of winter comes the test of last summer's painting. The bright colors of leaves and flowers that beautified the property are gone. The house stands by itself against gray skies, amongst the bare branches of trees. When snow covers the lawns and sets a standard of purest white, will the paint on the homes that you designed look as well as when you saw them last in the summer or early fall?

Homes painted with Eagle White Lead will be just as handsome, for the beauty is painted onto the house itself.

Though boards creak with frost and snow and icy rain beat upon the paint film, the houses painted with Eagle White Lead will stand the test of winter.

For the qualities of durability and long continued whiteness under severest conditions were developed in Eagle White Lead by the Old Dutch Process of slow sure corrosion during the ninety days that the White Lead was forming in the tan bark beds.

Should a process be discovered that is a better process for the production of white lead and not merely a cheaper one, The Eagle-Picher Lead Company will consider its adoption. Until that time, Eagle will continue to be Pure Old Dutch Process White Lead in Oil, as it has been since 1843.

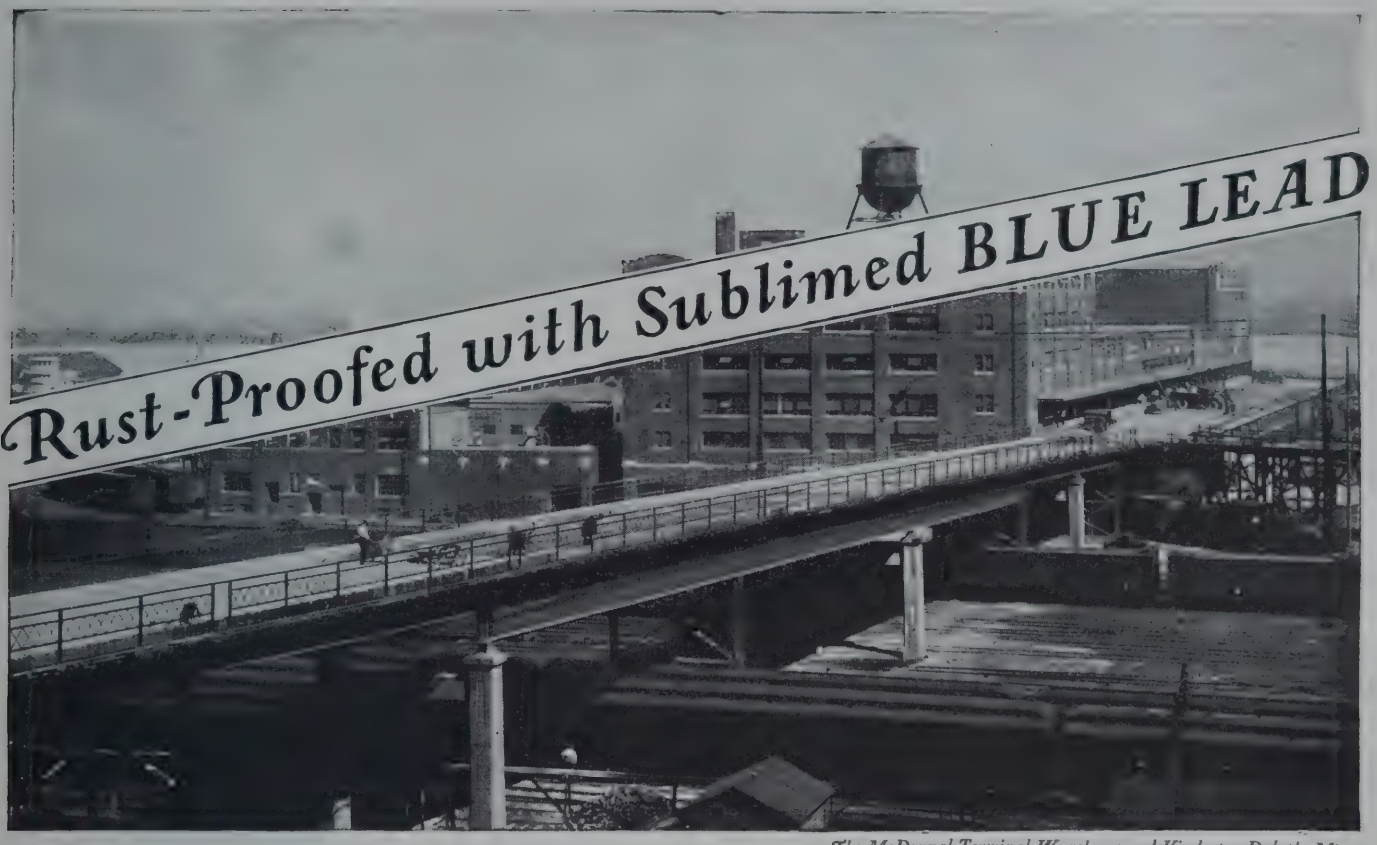
General Offices: The EAGLE-PICHER LEAD COMPANY, 860-208 *So. La Salle St.* · CHICAGO

EAGLE *Pure Old Dutch Process* WHITE LEAD

Sales Offices: CINCINNATI CLEVELAND PITTSBURGH PHILADELPHIA NEW YORK MINNEAPOLIS BUFFALO DETROIT BALTIMORE NEW ORLEANS KANSAS CITY ST. LOUIS JOPLIN

Plants: CINCINNATI NEWARK GALENA, KAS. HENRYETTA, OKLA. PICHER, OKLA. CHICAGO EAST ST. LOUIS, ILL. ARGO, ILL. JOPLIN, MO. HILLSBORO, ILL. (2 *Plants*) ONTARIO, OKLA.

© The E. P. L. Co., 1924



The McDougal Terminal Warehouse and Viaduct—Duluth, Minn.

Combating Corrosive Gases, Heat, Cold, Wind and Water

THE almost constant stream of corrosive and sulphurous gases from the locomotives plying beneath immeasurably speeds the corroding action of wind and water attacking the railway viaduct.

Jacobson Brothers, the contractors, of Duluth selected Sublimed Blue Lead in Oil to meet this most severe test of a rust-proofing paint on the McDougal Terminal Viaduct. The structural steel in the building is also protected with Sublimed Blue Lead in Oil for the life of the building.

Sublimed Blue Lead in Oil will not harden in the container.

The paint, properly mixed, works so easily and smoothly under the brush that a painter can cover a greater area in a day and still produce a paint film that is free from breaks, runs, or alligatoring The paint film is also virtually insensible to changes in temperature.

One hundred pounds of Sublimed Blue Lead in Oil will cover 5216 square feet of iron or steel. This is equivalent to a surface a foot wide and nearly a mile long. It is practically double the performance of the pigments now most used for rust inhibitive purposes.

The durability of Sublimed Blue Lead in Oil as a long time protector of metal surfaces has been proved both in tests and in the field.

Send for your copy of "Fighting Rust with Sublimed Blue Lead."

The EAGLE-PICHER LEAD COMPANY 860-208 *South La Salle Street* · CHICAGO

EAGLE *Picher Sublimed* BLUE LEAD *in* OIL

CINCINNATI CLEVELAND PITTSBURGH PHILADELPHIA NEW YORK MINNEAPOLIS
BUFFALO DETROIT BALTIMORE NEW ORLEANS KANSAS CITY ST. LOUIS JOPLIN

Plants: CINCINNATI NEWARK GALENA, KAS. HENRYETTA, OKLA. PICHER, OKLA.
EAST ST. LOUIS, ILL. CHICAGO ARGO, ILL. JOPLIN, MO. HILLSBORO, ILL. (2 *Plants*)

12 PFAUDLER CHUTES IN ONE INSTALLATION

at the

HUDSON COUNTY HOSPITAL FOR THE INSANE

SECAUCUS, N. J.

We are now building 12 Pfaudler Glass Lined Chutes for the Hudson County Hospital, New Jersey. The chutes are as follows:

Ten—27′ chutes, for Buildings 4-A, 4-C, 4-E, 5-A, 5-C, 5-E, 5-F, 7-A, 7-C, and 7-E.

Two—16′ chutes, for Buildings 4-F and 7-F.

This is the largest single laundry chute installation ever made in the hospital field, to our knowledge. Further, it indicates, as have many of our other recent installations, that the two-story hospital can use a laundry chute quite as effectively as a taller building.

THE PFAUDLER CO.
Rochester, N. Y.

Makers of the Glass Lined Steel Laundry Chute

BRANCHES IN MAIN CENTERS

Pfaudler

GLASS LINED STEEL LAUNDRY CHUTE

AN ALL-PURPOSE VARNISH THAT SIMPLIFIES FINISHING

How an improved method of fusing oils and gums makes Master Varnish ideal for all uses—inside and out

WITH the overwhelming demand for new buildings of all kinds and the consequent shortage of labor, time-saving methods are more urgent than ever before.

Specify Master Varnish wherever varnish is to be used. One crew of men, all with Master Varnish, can finish up any building in less time, and at less expense, than with one special varnish for this use and another for that.

Master Varnish is absolutely water, weather and mar proof. It will stand every test that any other varnish will and many that other varnishes cannot stand.

Let us send you a sample sufficient to finish a table or chair on which you can make any test you want.

O'BRIEN VARNISH COMPANY
1229 W. WASHINGTON AVE.
SOUTH BEND, INDIANA

"Varnish and Paint Makers for Half a Century"

This design is the identification mark for *genuine Ripolin Enamel.* All Europe knows this famous trade mark. The secret process of making Ripolin was discovered in Holland thirty years ago. Since that time Ripolin has been used throughout the civilized world.

RIPOLIN

THE ORIGINAL HOLLAND ENAMEL PAINT

FILTEX

A Practical First Coater

Roosevelt Hotel, New York
Illustration by Welanetx Co.

Geo. B. Post & Sons, Architects
Barker Painting Co., Painters

In the Roosevelt Hotel, the embodiment of public service, Filtex also renders service. Filtex, an unusual, transparent, pigment first coater, forms a smooth, impervious film that eliminates suction on porous surfaces. By holding out the finishing coats and preventing loss, it serves architects, painters and owners alike.

Save the surface and you save all

The Pratt & Lambert Architectural Service Department is at your service. Let us help you with your wood-finishing problems.

Save the surface and you save all

PRATT & LAMBERT-INC., 122 Tonawanda St., Buffalo, N. Y., In Canada: 34 Courtwright St., Bridgeburg, Ontario.

PRATT & LAMBERT VARNISH PRODUCTS

City Hall, New York
from an original sketch by O. R. Eggers appearing in "Sketches of Early American Architecture"

New York City Hall

restored from time-faded drawings

Modern wonders of architecture overtop New York's City Hall on every side. Yet to this day architects regard this old building as unexcelled for perfect proportions and beautiful design.

It was built in 1803-12 at a cost of $500,000, an enormous expenditure in those early days of city finance. John McComb, Jr., the architect-builder, received but six dollars a day for his services. For this sum he developed a set of drawings which are considered today as excellent examples of artistic skill.

From these old drawings made by McComb, all but one of the historic interiors of City Hall, which had been altered by changing city authorities, have now been restored as nearly as possible to their original design.

The thoroughness with which this restoration work has been preserved and protected for future generations is shown by the treatment of the Governor's suite.

This suite is finished in a mellow cream enamel. Foundation coats of Dutch Boy white-lead and oil were followed by two coats of enamel. Each coat of paint was thoroughly sandpapered. The enamel was rubbed down with pumice stone and water.

The restoration and decoration of the Governor's suite, as well as the other interiors of New York's City Hall were executed by Grosvenor Atterbury, Architect, F. A. I. A., with the collaboration of his associate, John Almy Tompkins.

Plates of John McComb's original drawings sent free

In all of this restoration work, McComb's original drawings, wherever they existed, were painstakingly followed. We have been permitted to reproduce a few of these drawings in a Portfolio of Early American Architecture, which also contains accurate measured drawings of other noteworthy Colonial buildings. It will be sent free to any architect who writes for Portfolio No. 22.

The historical notes you have just read will not, however, appear in the Portfolio. So keep this page for reference after you receive your Portfolio.

"Save the surface and you save all"—Dutch Boy

NATIONAL LEAD COMPANY

Makers of Dutch Boy white-lead, the logical choice for preserving and beautifying distinctive design

New York, 111 Broadway; Boston, 131 State St.; Buffalo, 116 Oak St.; Chicago, 900 West 18th St.; Cincinnati, 659 Freeman Ave.; Cleveland, 820 West Superior Ave.; St. Louis, 722 Chestnut St.; San Francisco, 485 California St.; Pittsburgh, National Lead & Oil Co., of Pa., 316 Fourth Ave.; Philadelphia, John T. Lewis & Bros. Co., 437 Chestnut St.

Brasco *Indirect Screw Pressure* Gives Absolute Glass Safety

One of the most vital factors in store front construction is the provision for holding the glass *safe* against breakage.

The remarkable records that Brasco fronts have made in glass safety, by actual check up in cities and towns throughout the country, are due not only to the extra wide, supple and uniform grip on the glass but in large measure to the principle of *indirect screw pressure*.

Brasco differs from ordinary fronts in that no screw points directly toward the glass, and there never is danger, therefore, of the glass settling down on any screw.

This distinctive method of fastening removes all possibility of any holding strain being transmitted to the plate, because it is taken where it belongs—by the supporting members.

Vibration, shock or wind and storm pressure cannot possibly force the glass into contact with the screws to crack and ultimately smash the plate.

Brasco safety to glass is recognized universally by architects, owners and merchants. It has lowered insurance rates in many instances and is recommended and used broadly by insurance companies themselves.

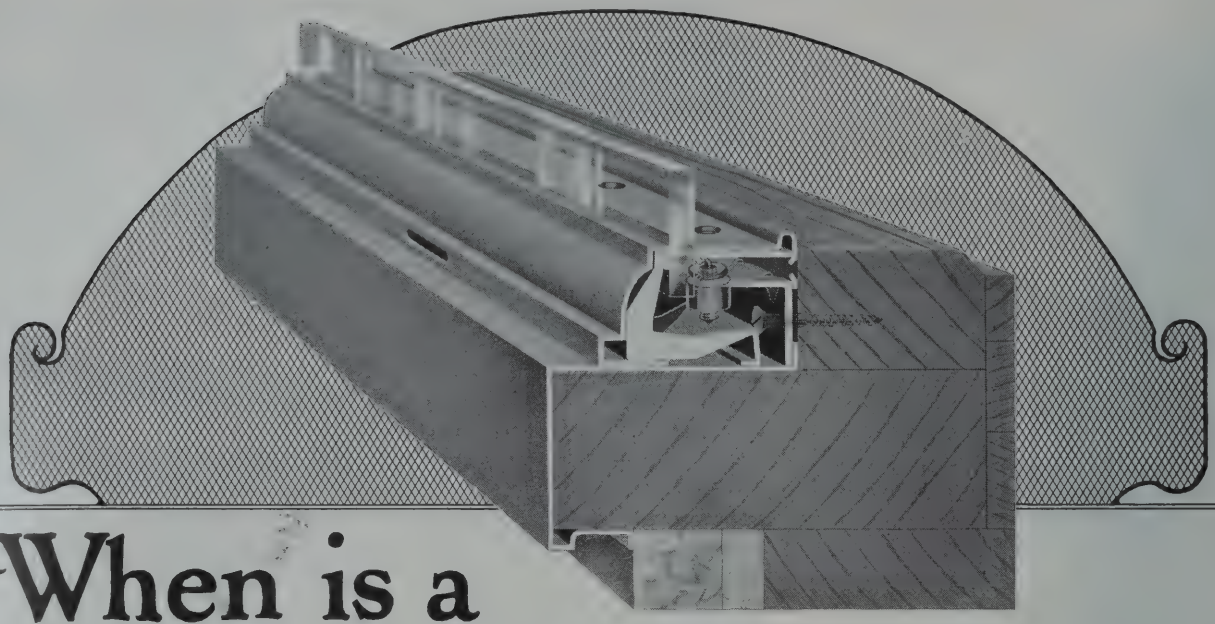
This and many other advantages are explained in our catalog, gladly sent to any architect on request. Full size detail sheets and actual samples are also available. We are glad to assist.

Brasco Manufacturing Company

5031 South Wabash Ave., Chicago

Brasco

COPPER STORE FRONTS



When is a Store Front *Most* Economical?

Answer:—When it is a Zouri Safety Key-Set store front.

A Zouri window is set firmly, is stronger, offers more resistance to stress and strain and therefore lasts longer. Its initial cost prorated over its multiplied years of service proves Zouri to be a most economical investment.

Unbiased guarantee of quality is the inspection stamp of the Underwriters Laboratories appearing on all Zouri Safety Key-Set Sash and Bars. It means highest grade materials, finest craftsmanship, conscientious construction and consequent durability.

An attractive, well appointed Zouri Store Front "gets the people in." It reflects the quality of the merchandise and progressiveness of the management.

Free—our big catalog illustrating types of windows and settings and constructive technical data, also illustrated book of valuable suggestions to retailers on methods of "Getting the People In"

Zouri

Safety Metal Store Fronts

prevent glass breakage during installation or from distortion after the glass is installed.

Murnane Self-Adjusting Setting Blocks bring the glass into firm and even contact with the full face of the rigid rabbet. Zouri Key-Set construction holds it there.

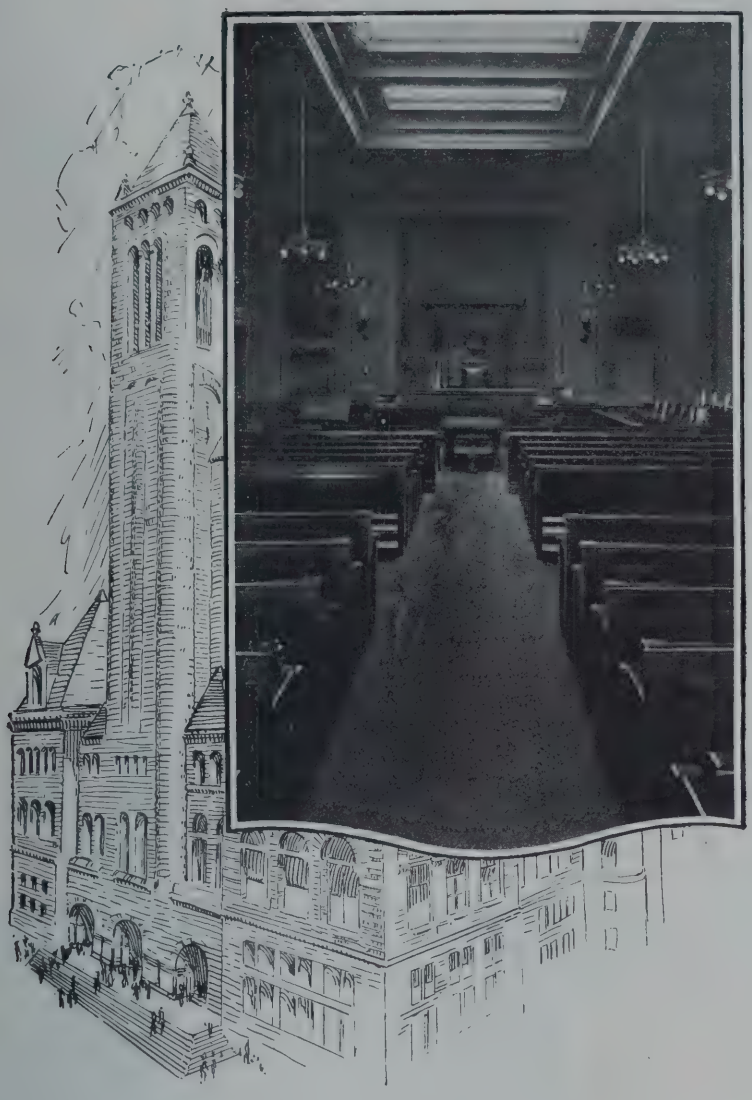
In Zouri sash the glass is held in place by indirect screw pressure—more certain and perfectly safe.

There's a distributor near you who will give you full details without obligation. Write for his name.

Zouri Drawn Metals Company

FACTORY AND GENERAL OFFICES

1608 East End Avenue, Chicago Heights, Illinois



An Armstrong Cork Tile floor in the Stearns County Court House at St. Cloud, Minn. It is an admirable flooring for court rooms and other public assembly places where crowds come and go and where quiet is essential. Architects, Toltz, King & Day, St. Paul, Minn.

The Durable, Quiet, Comfortable Floors of Modern Public Buildings

The mistaken notion that a *durable* surface must be a *hard* surface is largely responsible for the uncomfortable, noisy, slippery, and often unsightly floors in many of the older public buildings.

That floors *can* be durable and at the same time comfortable, quiet, non-slippery and beautiful is exemplified in the increasing use of Armstrong's Cork Tile. Here is a flooring that totally disproves the idea that durability is synonymous with hardness. Yielding—almost soft—underfoot, it nevertheless stands up under hard service with little, if any appreciable wear. Its resilience protects it against abrasion. It does not crack, craze or "dust".

Armstrong's Cork Tile in public buildings means comfort underfoot for employees and visitors; security against slipping on level, ramp or stair; freedom from the distracting tramp and scuffle of feet; a distinctive and pleasing appearance; and durability that insures years of service.

Armstrong Cork & Insulation Co., 142 24th St., Pittsburgh, Pa.

Armstrong's Cork Tile

Ft. Worth's Leading Office Building ASBESTONE *Floored*

In the Dan Waggoner Building, Ft. Worth, Texas, 90,000 square feet of ASBESTONE Flooring is giving perfect service. Fireproof—waterproof—hygienic. ASBESTONE is the ideal medium-priced flooring for offices, schools and other public buildings. It is very attractive in appearance, resilient to the tread, and lasts a lifetime. Although made of the very finest materials that can enter into a composition flooring, it is installed at a very moderate price.

In order to insure perfect workmanship, we install all ASBESTONE floors with our own force of experienced men. Estimates will be sent on receipt of blue prints and specifications, informing you exactly the cost of the completed floor, and the cost will be surprisingly low. No obligation.

Our new ASBESTONE Flooring Book graphically illustrates the beauty of color effects and border designs. Write us for it today.

FRANKLYN R. MULLER, Inc.
201 Madison Street, Waukegan, Illinois

MULLER
ASBESTONE
GUARANTEED PRODUCTS
TRADE MARK

Curtis Standardization Saves Your Time

A Staircase that will not creak
This beautiful Curtis Colonial staircase is put into place with all joints wedged, tongued and grooved, mortised and dovetailed. Curtis-made stair parts have absolute goodness in every detail. Refer to C-902 in correspondence.

Next time you plan a home, look over the variety of designs and suggestions contained in the Curtis detail sheets. Select from them the items and designs you favor and instruct your draughtsmen to incorporate them in your plans.

You'll be pleased with the saving in time this will effect, and you'll find ample opportunity for self-expression because of the almost limitless variety from which to choose.

And incidentally you will favor your client by giving him the benefit of Curtis Standardization of materials and workmanship.

Let the nearby Curtis dealer acquaint you with the service he has to offer.

The Curtis Companies Service Bureau
315 Curtis Building, Clinton, Iowa

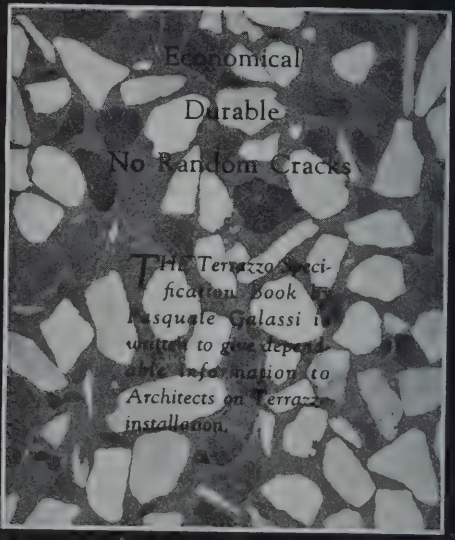
Curtis Companies Inc., Clinton, Iowa
Curtis Detroit Co., Detroit, Mich.
Curtis Bros. & Co., Clinton, Iowa
Curtis & Yale Co., Wausau, Wis.
Curtis Sash & Door Co., Sioux City, Iowa
Curtis, Towle & Paine Co., Lincoln, Nebr.
Curtis, Towle & Paine Co., Topeka, Kans.
Curtis-Yale-Holland Co., Minneapolis, Minn.
Curtis Door & Sash Co., Chicago, Ill.
Sales Offices in: Pittsburgh - New York - Baltimore

Curtis Woodwork is sold by retail lumbermen east of the Rockies. Make sure the woodwork you buy bears this trade-mark.

1866 CURTIS

The makers of Curtis Woodwork are proud to identify their products by this mark.

TERRAZZO
— by GALASSI —



The Galassi Company
153 East 38th St. NEW YORK
11 Bennet St. BOSTON

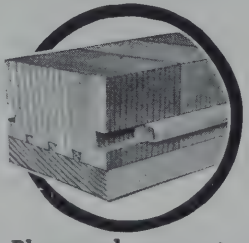
FLOORING

BLOXONEND

The Block Flooring that Stays Smooth

How long will it stay smooth? That's the important thing to consider when selecting a factory flooring. A floor, no matter how durable, that isn't smooth after a few years' service does not justify its original cost—its long life is valueless.

Smooth floors increase efficiency in trucking whether with men or with tractors by permitting the moving of heavier loads in less time, with less energy and without damage to trucking equipment or cargoes.



Bloxonend comes to the job in 8-ft. lengths with the small, tough blocks dovetailed endwise onto baseboards.

Bloxonend is made of Southern Pine with the tough end grain up. That means *durability*. And along with durability, Bloxonend combines the smoothness of dressed and matched flooring. It is the only end grain flooring so designed that it *must stay smooth.*

Note that Bloxonend lays directly over concrete, new or old. The "built-up" 8-foot lengths are splined and nailed together—the nails being furnished positioned in countersunk bores ready for driving.

There is an installation of Bloxonend Flooring—in industrial plant, bakery, publishing plant, school, etc.—in practically every city of any size in the United States. If you are designing a building that will require durable floors of lasting smoothness, you should investigate Bloxonend. Write nearest office today for architectural specifications.

CARTER BLOXONEND FLOORING COMPANY
Kansas City, Missouri

NEW YORK
501 Fifth Avenue

CHICAGO
332 So. Michigan Ave.

BOSTON
910 Broad Exchange Bldg.

BLOXONEND
Lays Smooth FLOORING *Stays Smooth*

CLEVELAND
1900 Euclid Avenue

SAN FRANCISCO
907 Hobart Bldg.

DETROIT, MICH.
2328 1st Nat'l Bank Bldg.

MasterMix

SAFEGUARDS WINTER BRICKWORK

The Pershing Square Bldg., New York. Yorke & Sawyer, Architects —C. T. Wills, Contractor This is but one of many winter-built buildings of the first magnitude whose brickwork has been safeguarded and mortar joints waterproofed by the use of Master Mix.

Architects recognize the necessity of a waterproof brick mortar joint and the difficulty of securing it in freezing weather. Master Mix produces waterproof joints at freezing temperatures, and saves its cost by maintaining warm weather workability, eliminating a principle cause of delay in winter construction.

THE MASTER BUILDERS COMPANY
Cleveland, Ohio **Irvington, N. J.**

One of Ninety-one

AMONG the many fine buildings in the Middle West covered with Ruberoid Built-up Roofs is the Joliet High School; F. F. Allen and D. H. Burnham & Co., architects.

The Joliet High School is one of ninety-one contracts, involving over 350,000 square feet of roof surface, carried out by the Olsson Roofing Co. of Aurora, Ill., during the past fifteen months—*each* being a Ruberoid Built-up job.

It is particularly significant that Ruberoid Built-ups have attained such success in the Middle West where severe winters often follow intensely hot summers. Ruberoid roofs do not crack or soften. Their ingredients—Ruberoid Cap-sheet, Ruberoid Solid-cement and Ruberoid Asphalt Felt—retain their weather proofing qualities for many years, in spite of climatic conditions.

Architects, builders and construction engineers throughout the world have found in Ruberoid Built-up Roofs the very qualities they most desire—unsurpassed ability to resist weather and wear combined with light weight and economy of construction.

Samples and specifications for various types of Ruberoid Built-up Roofs will be sent you on request.

There is but one Ruberoid—
Look for the Man on the Label.

The RUBEROID Co.
95 Madison Avenue, New York
Chicago Boston

RU-BER-OID
Built-up Roofs

Every morning the Sun comes up on 10 thousand "Cementile" Roofs. How many of these have you specified?
Write for a Catalog
AMERICAN CEMENT TILE MANUFACTURING CO.
831 Oliver Bldg., Pittsburgh, Pa.
Plants: Wampum, Pa.—Lincoln, N. J.—Birmingham, Ala.
Offices: Pittsburgh, New York, Philadelphia, Atlanta, Birmingham
Specify
CEMENTILE
The Roof Everlasting
BONANZA CEMENTILE
BONANZA CEMENTILE

KEYSTONE COPPER STEEL

EXTEND your business by using sheet metal products that have an established reputation for durability and trustworthiness. This means economy to users, and a practical business aid to the building construction interests—architects, contractors, sheet metal workers, and metal lath manufacturers.

Black and Galvanized SHEETS

When Copper Steel is used, the Keystone is included in the brand.

Roofing Tin Plates

Made from Keystone Copper Steel; highest quality roofing terne plates produced in this country—grades up to 40 pounds coating. These Plates assure better roofs, and the utmost of lasting and satisfactory protection—fireproof, durable, and economical.

The destructive enemy of sheet metal is *rust*. It is a well established fact that an alloy of copper gives to Steel Sheets and Tin Plates the maximum of *rust-resistance*. Keystone Copper Steel is unequaled for roofing, siding, spouting, gutters, culverts, metal lath and similar uses. It assures roofs and sheet metal work that will withstand the ravages of fire, wear and weather. Shall we send proofs from actual service tests? We manufacture Steel Sheets and Tin Plates for all purposes and specially adapted to the requirements of architects and contractors: Black Sheets, Special Sheets, Apollo and Apollo-Keystone Galvanized Sheets, Corrugated Sheets, Formed Roofing and Siding Products, Roofing Tin Plates, Bright Tin Plate, Black Plate, Etc. Sold by leading metal merchants. Our products represent the highest standards of quality and utility. Write nearest Sales Office for quotations and *"Testimony"* booklet.

American Sheet and Tin Plate Company

General Offices: Frick Building, Pittsburgh, Pa.

DISTRICT SALES OFFICES:

Chicago Cincinnati Denver Detroit New Orleans New York Philadelphia Pittsburgh St. Louis

Export Representatives: United States Steel Products Company, New York City

Pacific Coast Representatives: United States Steel Products Company, San Francisco, Los Angeles, Portland, Seattle

Residence of Harry C. Stutz, Indianapolis, Indiana. C. A. Gardner, Architect.

The Choice of Harry C. Stutz

A MAN who achieves a reputation for making a quality product is likely to be a user of quality products himself. Hence it's not surprising that Harry C. Stutz, the well-known builder of high-grade motor cars, selected IMPERIAL Roofing Tiles for his attractive new residence at Indianapolis, Indiana.

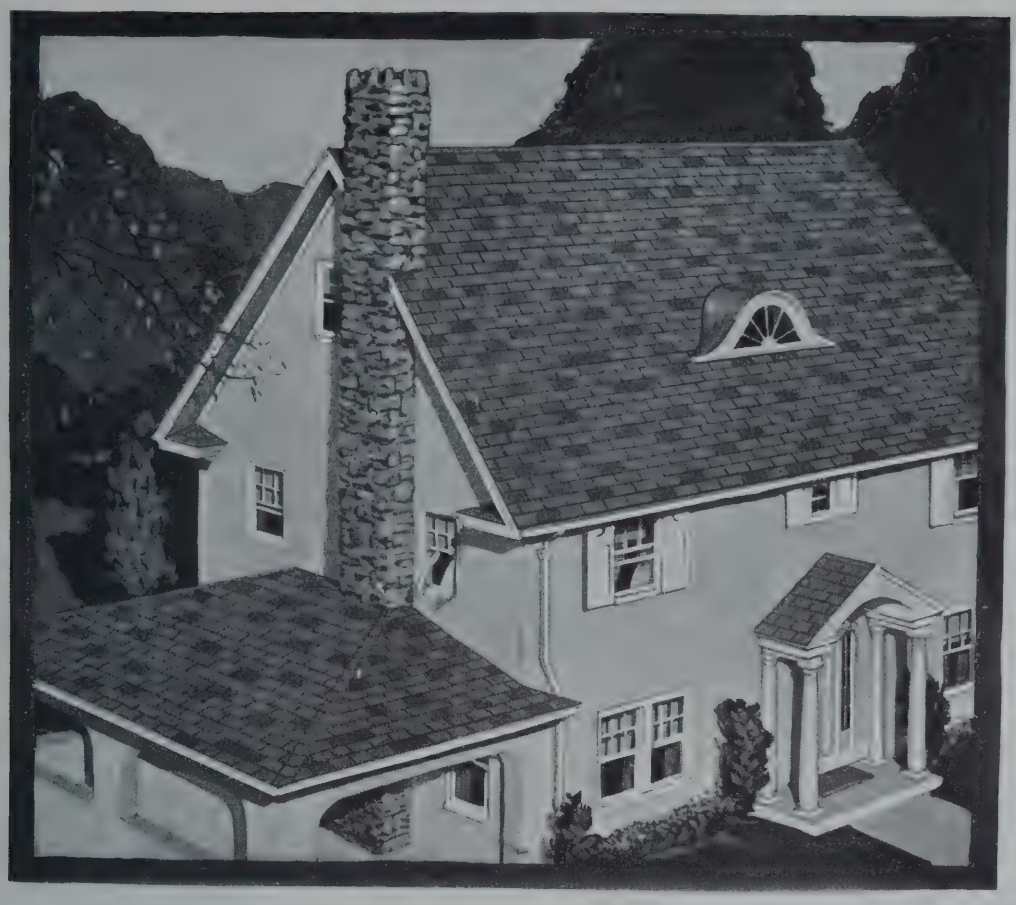
For generations to come, this roof will stand as a tribute to the good judgment of the builder. Neither sun nor wind nor rain nor snow will affect its permanency or coloring. Like all quality products, IMPERIAL Roofing Tiles cost a trifle more at first. But in the end they pay for themselves many times over.

IMPERIAL Roofing Tiles

LUDOWICI-CELADON COMPANY

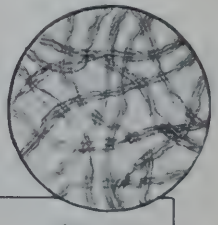
104 South Michigan Avenue · *Chicago*

565 Fifth Avenue · *New York*



The home of Mr. and Mrs. Clarence Bahlman, 3429 Herschel Avenue, Cincinnati, Ohio. It has a Richardson Multicrome Roof in opal

Note under the microscope how the long fibres of Richardson felt interlock to bind the Viskalt into an enduring weather-proof armor



A roof of rare new color—*opal* beautifies this Cincinnati home

To Mr. and Mrs. Clarence Bahlman, 3429 Herschel Avenue, Cincinnati, Ohio, belongs the distinction of being the first to have on their home the new Richardson *opal* roof. A wholly new color, it attracted much attention even while it was being laid. Completed, it more than fulfilled their expectations of unusual beauty.

This roof is built from the new Richardson opal shingles, no two of which are alike. On each are blended the two most beautiful Richardson colors in slate—weathered brown and jade green.

When these shingles are applied to the roof just as they come from the bundle, the result is a delicately mottled coloring like the play of light on a rippled mountain lake.

The Richardson Multicrome Roof

This, however, is but one example of the beauty secured in the Richardson Multicrome Roof. Equally attractive is the bronze mosaic coloring made by combining weathered brown and tile red slate flakes in the same manner. Many other color effects are possible—one to please every taste.

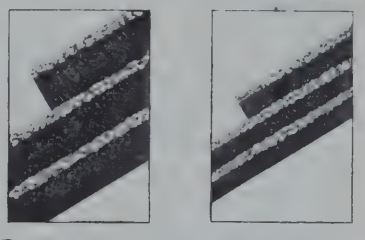
The Multicrome Roof is built of Richardson Super-Giant Shingles, extra large, extra heavy—to give greater beauty, longer endurance. The high quality of its inner materials, too, assures lasting beauty for this roof. Its base is sturdy Richardson felt, for fifty years recognized as the best. And the waterproofing is Viskalt—unusually durable because 99.8% pure bitumen, especially vacuum-processed.

50% thicker, it casts a deeper shadow line on the roof. Thus it is suitable for the more expensive homes as well as those of moderate cost.

Write for our new booklet

If you have not already discovered the beautiful effects made possible by these new colors write us. We will send you our new booklet, *Roofs of Distinction*, together with samples of Richardson Super-Giant Shingles in opal, weathered brown and other colors. Just use the coupon below.

The RICHARDSON COMPANY
Lockland (Cincinnati) Ohio
Chicago New York City (1008 Fisk Bldg.)
New Orleans Atlanta Dallas



Richardson Multicrome Roof **Ordinary Roof**

cross sections equally enlarged

The 50% greater thickness of this roof adds beauty of texture and years of endurance. Closely over-lapping slate flakes further protect the sturdy Viskalt-saturated base against weather and fire hazards

Clip and mail this coupon

THE RICHARDSON COMPANY
Dept. 62-K, Lockland, Ohio
Gentlemen: Please send me samples of Richardson Super-Giant Shingles, your new booklet, and further facts about Richardson Roofing.

Name .....

Address .....

© 1924, The Richardson Company

RICHARDSON ROOFING

The service that made friends and the quality that keeps them

THE building that is going to house the library, the theatre or public business and pay full returns in freedom from the cost of repairs deserves more than an "ordinary" roof. It should be "roofed for permanence" with a roof tailored to fit.

Years of experience, accumulated in the designing and erection of roofs on every type of building have taught Federal engineers the secrets of every roofing problem, and of speed! The Ford Motor Company assembly plant at Memphis, with a quarter million square feet of roof—over six acres—was roofed in nineteen working days.

Such a service insures the maximum in roof permanence and roof economy.

Made, laid and guaranteed by the
Federal Cement Tile Company
608 S. Dearborn Street, Chicago

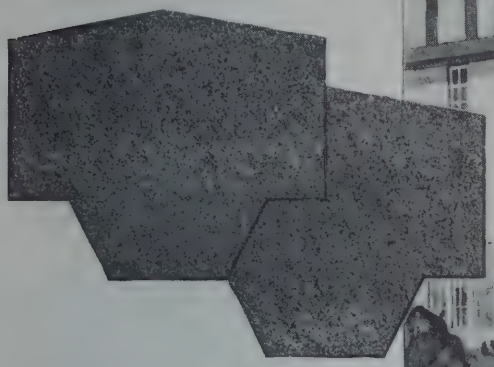
FEDERAL Cement Tile

"The Roof for Permanence"

AF12-S-RTG

Preston ROOFING

THIS *distinctive design exposes two thicknesses at the butts, thereby creating the definite shadow-line demanded by architects.*



THE *design of the patented Hexo-Diamond Shingle produces at least two layers over the entire roof.*

The unusual thickness of Preston Shingles makes a durable roof.

Shingles that make your home distinctive

THE colors of Preston Shingles are produced by the natural tints of the slate and stone particles with which they are surfaced. These shingles add the final touch of charm to any home whether mansion or cottage.

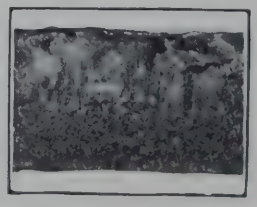
The design of the patented Hexo-Diamond Shingle makes a pattern which is a series of uniform hexagons.

Preston Hexo-Diamond Shingles are made in three weights: Standard, Extra Heavy and Massive, and beside the Sunset shade in three colors: Green, Blue-Black and Red.

The "massive" weight is much thicker than any other slate-surfaced asphalt shingle on the market and approximately one-third thicker that a Standard No. 1 slate shingle.

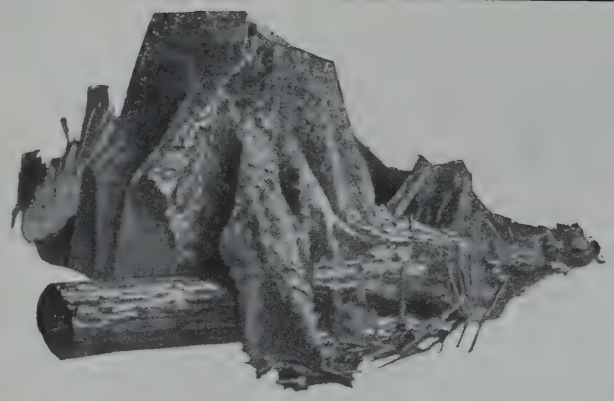
We shall be glad to send you name of Regional Distributor on request.

KEYSTONE ROOFING MANUFACTURING COMPANY, YORK, PENN.



MICROSCOPIC ENLARGEMENT

THE *wearing qualities of Preston shingles depend not only on the quality, but on the quantity of asphalt which each shingle contains. If you examine the edge of a Preston Shingle you will notice that it is practically a solid body of asphalt. This feature of Preston Shingles accounts for their remarkable wearing quality.*



REDWOOD tree trunk, sound and free from decay after burial in moist ground under a tree whose annular rings indicated an age of 600 years. Sent to the mill, this centuries-buried Redwood was sawn into good lumber.

Why Redwood houses last for generations

THE notion that frame houses are but temporary structures seems ill-founded when one sees the old New England houses—some of them well over 200 years old and built entirely of wood. The discovery of this Redwood tree, still sound, although buried since before Columbus sailed, suggests the durability and permanence of Redwood as a building material. This centuries-buried Redwood was sent to the mill and sawn into good lumber.

The permanence of a frame house depends on the kind of wood that goes into its construction. Some woods are comparatively short-lived and subject to decay. The U. S. Forest Products Laboratory has studied and tested all commercial woods. In "Technical Note No. 173," recently issued, it gives Redwood the highest total rating for *durability, lack of shrinkage, strength as a beam or post, ease of glueing, workability* and ability to "stay put."

A digest of this government publication entitled *"Physical and Mechanical Properties of Redwood in Comparison with Other Woods"* has been compiled and will be gladly sent to you on request. It gives an authoritative answer to the questions of what woods to use and what can be reasonably expected from each kind.

In brief, these are some important advantages of Redwood: permeated during growth with a natural preservative, it is not subject to fungus decay and it is unattractive to boring worms and insects; properly seasoned, it does not warp, swell, twist or shrink; it takes and holds paint exceptionally well; it contains no pitch or highly inflammable substances, and therefore reduces the fire hazard wherever used.

SPECIFY Redwood for Siding, Exterior finish, Window, door and cellar frames, Shingles, Foundation timbers and mudsills, Interior trim, Mouldings, Lattice, Lath and plaster grounds, Pergolas, Greenhouses, Garden furniture.

Write for "Physical and Mechanical Properties of Redwood in Comparison with Other Woods."

The Pacific Lumber Co.
Redwood

CHICAGO 3063 McCormick Bldg. 332 So. Michigan Ave.
NEW YORK CITY 922 Pershing Sq. Bldg. 100 East 42nd Street
SAN FRANCISCO Robert Dollar Bldg. 311 California St.
LOS ANGELES Central Building 6th & Main Streets

The Largest Manufacturers and Distributors of California Redwood

Common brick walls finished with Cabot's Old Virginia White; roof stained with Cabot's Creosote Shingle Stain, Lichen Green. F. A. Cooper, Architect, Chicago

Artistic Treatment of Common Brick

The effect of the brilliant white tone and the flat, velvety texture of

Cabot's Old Virginia White

is so pleasing that it transforms the cheapest and dullest brick into an artistic building material. Old Virginia White has a real "white stain" quality, and with the Lichen Green roof this house is a striking and harmonious picture.

Samples and full information on request

SAMUEL CABOT, INC. Manufacturing Chemists BOSTON, MASS.

342 Madison Ave., New York
525 Market St., San Francisco
24 West Kinzie St., Chicago
Hibernian Bldg., Los Angeles

Cabot's Creosote Stains, Insulating and Deadening Quilt, Brick and Stucco Stains, Conserve Wood Preservative, etc.

Artistic irregularity in thatch effects

THE uneven butts of WEATHERBEST Thatch Red Cedar Stained Shingles afford a welcome relief from the monotony of straight lines formerly considered unavoidable in roof design. In a similar manner WEATHERBEST Angle Butt Red Cedar Stained Shingles lend a pleasing touch of softness to sidewalls. And in all cases WEATHERBEST uniform edge-grain means prolonged attractiveness through color preservation and freedom from warping or curling.

Write for color samples and illustrated booklets.

WEATHERBEST STAINED SHINGLE CO., Inc.
142 Main St., North Tonawanda, N. Y.
Western Plant, Minnesota Transfer, Minn.

New Jersey Zinc

The world's Standard for zinc products

"Neither snow nor rain nor heat—"

Year after year a roof and the devices that drain it must wage war with the elements. If the battle is mechanical, the years will be many. But if it is chemical, the years will be few. Conductor pipes, gutters, and standing seam roofing of Horse Head Zinc are permanent, for they cannot rust.

The New Jersey Zinc Company
Established 1848
Products Distributed by
The New Jersey Zinc Sales Company
(INCORPORATED)
NEW YORK · CHICAGO · PITTSBURGH · CLEVELAND · SAN FRANCISCO

Books on Various Technical Subjects

A list of recommended works on topics of importance to architects and engineers

Ventilation

An exhaustive work on the subject, being the report of the New York State Commission on Ventilation appointed by the Governor at the request of the New York Association for Improving the Condition of the Poor and supported by the Milbank Fund. The work discusses ventilation in buildings of many kinds, but chiefly in schools and other public or semi-public buildings.

620 pp., 7 x 10 inches.
Price, $15

Collected Papers on Acoustics

By Wallace Clement Sabine

The work which is generally regarded as laying the foundation of the study of acoustics and the other branches of effort which grow out of it. It is the result of exhaustive research and much experiment with different materials and methods of building.

278 pp., 7½ x 10½ inches.
Price, $4

Town Planning and Town Development

By S. D. Adshead

This practical work takes up the question of town planning in a very broad way, beginning with its sociological aspect and the relation of large productive centers to their recreative and residential areas. Zoning, zoning laws and principles receive due attention, as does also the matter of town planning by private initiative, of which several peculiarly interesting examples are given, with plans and illustrations.

204 pp., 5½ x 8½ inches.
16 plates and 18 diagrams in the text.
Price, $5

The Planning of Apartment Houses, Tenements and Country Homes

By Teunis J. Van der Bent

A complete treatise on the planning of these structures, with particular attention given to the methods of utilizing plot areas to the greatest advantage.

355 pp., 9 x 12 inches.
Price, $4.75

Handbook of Ornament

By Franz Sales Meyer

A standard work on the use of ornament in architecture and decoration. Illustrated with 300 full-page plates of the ornament of all the historic periods of architecture. More than 3,000 illustrations.

548 pp., 6 x 9 inches.
Price, $3.60

Acoustics of Buildings

By F. R. Watson

A late work on the important subject of acoustics, presenting the most recent results of research and recording the effects of experiment with different building materials under various conditions. The soundproofing of buildings and rooms is also considered.

155 pp., 6 x 9 inches.
Price, $3

Housing Progress in Western Europe

By Edith Elmer Wood

In this volume a student of social and housing conditions sums up the progress made in England, France, Holland, Belgium, Germany, Italy and elsewhere in Europe, and gives a comparison with the results which have been attained in America. Excellent illustrations add to the value of the data presented.

210 pp., 5½ x 8 inches.
Price, $3

Architectural Composition

By Nathaniel Cortland Curtis

An excellent work on composition and particularly on the study and analysis of the plan. Illustrated by drawings by the author of buildings ancient and modern.

250 pp., 7 x 9½ inches.
Price, $6

Any of these volumes will be sent, carriage prepaid, to any address in the United States on receipt of price.

ROGERS & MANSON COMPANY
383 Madison Avenue
New York

NUMBER THIRTY-SIX OF A SERIES

Recital Hall in Smith Memorial Building, University of Illinois
James M. White, Supervising Architect

American Walnut

improves acoustics and adds beauty to this classical recital hall

THIS classically beautiful recital hall in the Smith Memorial Building at the University of Illinois is a fine example of modern adaptation of the graceful Italian Renaissance style.

"In studying this room for its acoustic properties," writes Architect James M. White, "it was felt that considerable wood paneling would be required to increase the resonance. American Walnut was selected as the wood most in keeping with the classical style of architecture adopted."

Here is another quality of American Walnut revealed in this gracious music chamber. Resonance which adds beauty of tone, volume of sound and trueness to pitch to fine music produced within its paneled walls.

Walnut has always been known for its loveliness and for the variety of its patterns and designs; its durability which has defied the ages. It is the wood supreme which combines all the attributes of other good cabinet woods. And it is a thoroughly practical wood for its color is natural, not due to surface staining, so it does not betray dents and scratches. And it is easily kept looking its best.

Architects and decorators ever are finding new charms and gifts—new inspiration—from American Walnut.

Send for the "Walnut Book," useful information and history of American Walnut. Also specification notes for interior trim. Both are free. Write today.

AMERICAN WALNUT MANUFACTURERS' ASSOCIATION
Room 1000, 616 South Michigan Avenue - Chicago, Illinois

"Ripple" Figured Walnut

LONG-BELL

TRADE-MARKED LUMBER PRODUCTS

Now Include the Four Most Useful Building Woods

Douglas Fir - Southern Pine
California White Pine
Oak

THE opening of the new lumber manufacturing plants of The Long-Bell Lumber Company at Longview, Washington, has added Douglas Fir lumber and timbers to the list of Long-Bell trade-marked products.

This means that throughout the United States buyers can now obtain lumber and timbers of one or more species of wood bearing the Long-Bell trade-mark. It means that architects, universally, can choose, by brand, lumber products that have been safeguarded in manufacture to meet that important requirement so long a standard in Long-Bell production—*maximum building value.*

The addition of Douglas Fir to Long-Bell products means, furthermore, that this manufacturer is now a producer of the four most useful building woods—Douglas Fir, Southern Pine, California White Pine and Southern Oak.

Trade-marks on certain well-established building materials and household equipment have been of great assistance to architects and builders. They have found them to be a *guide* in selection.

The same significance of certain names on other materials is equally true with lumber. The Long-Bell trade-mark on lumber and timbers is an identification that assures protection to buyers and stands for a service that the builder has a right to expect.

Douglas Fir Lumber and Timbers; Southern Pine Lumber and Timbers; Creosoted Lumber, Timbers, Posts, Poles, Ties, Guard-Rail Posts, Piling; Southern Hardwood Lumber and Timbers, California White Pine Lumber; Sash and Doors; Oak Flooring.

THE LONG-BELL LUMBER COMPANY

R. A. Long Building **Kansas City, Mo.**

Lumbermen Since 1875

KNOW THE LUMBER YOU BUY

RODDIS DOORS

Architects:
George B. Post & Sons
New York City

Contractors:
Amsterdam Building Co.
New York City

SYRACUSE HOTEL

Syracuse, N. Y.

FILLING an entire city block, this modern metropolitan hotel offers its guests the ultimate in furnishings, service and accommodations. And, therefore, it has Roddis Flush Doors installed throughout. For no other door provides so great beauty of appearance and durability of service.

Informed architects are now installing Roddis Doors in hotels of their planning, secure in their knowledge that these Doors are fully capable of standing up under the punishing usage they are to receive year after year. The reasons for this extraordinary long door-life are many. The exclusive Roddis design; the 5-ply construction; the ½-inch edge-strip of hardwood cemented around the top, bottom and sides, securely sealing the softwood core and keeping out moisture; the special waterproof glue that cements the door together for all time—these are the structural features every architect and every builder wants. As the result of this perfected construction, Roddis Doors can not sag, warp, shrink, swell, separate nor check. They can be fitted snugly. They are sanitary, fire-resisting soundproof. They are guaranteed without condition. And they are the most beautiful doors obtainable. This capacity for endless, perfect service is built into Roddis Doors. It is not on the surface. It can not be detected by outer inspection. The one and only assurance is the name and reputation of the maker. That is why architects make sure their doors are made and guaranteed by Roddis.

Roddis Doors have long been the prevailing choice of architects everywhere—not only for hotels but for buildings of every description, small or large.

Our 78-page catalog deserves permanent place in your files. A letterhead request will bring it.

RODDIS LUMBER & VENEER COMPANY, Marshfield, Wisconsin

Branches in all principal cities throughout the world

For a Quarter-Century, the Largest Makers of Flush and French Doors

Owner, Edgar Crilley *Architects, Chatten & Hammond*

HARTMANN-SANDERS
Koll Lock-Joint Columns—Pergolas—Rose Arbors
Garden Furniture and Accessories

KOLL LOCK-JOINT COLUMN
THEY CANNOT COME APART

Hartmann-Sanders ENTRANCES Beautify *any* home

How often you see the beauty marred of an otherwise magnificent home, because the architect's entrance details were either misunderstood or disregarded!

Hartmann-Sanders craftsmen know, from years of experience, the fine points of entrance construction. They carry out faithfully the architect's details. They make entrances that add beauty to ANY home.

In Hartmann-Sanders entrances we use architecturally correct Koll Lock-Joint Columns, with close-knitted, interlocking joints, which CANNOT COME APART. As America's largest designers and makers of fine columns, we enjoy many economies and advantages which result in unusual value.

Send for catalog I-47. Correspondence invited. Co-operation gladly given.

HARTMANN-SANDERS CO.
2187 Elston Ave., Chicago
Showroom: 6 East 39th St., New York City

No. 35

THE CUTLER MAIL CHUTE

manufactured in our own factory and installed by our own Experienced Factory Erectors, insuring uniform excellence of workmanship and prompt and satisfactory service.

Specify MODEL F Standard Equipment for Cutler quality at minimum cost. Send for form giving information required for estimating.

CUTLER MAIL CHUTE CO.
ROCHESTER, N. Y.

A Copper Screen Cloth Which Is *Stiff* As Well As Durable

In Jersey Insect Screen Cloth architects find, combined with unsurpassed durability of unalloyed copper (99.8% pure), a stiffness and tensile strength comparable to that of steel.

This is due to a special Roebling process for making the copper wire used exclusively in making Jersey. And it is *this* feature which puts Jersey Copper Screen Cloth in a class by itself.

You may specify Jersey with confidence that it is unrivaled by any other insect screen cloth.

May we send you samples? A word from you will bring them and you may rest assured that no annoying sales efforts will follow.

THE NEW JERSEY WIRE CLOTH COMPANY
638 South Broad Street
Trenton New Jersey

TRADE JERSEY MARK
Copper Screen Cloth
Made of Copper 99.8% Pure

Art Metal
Jamestown, New York
U. S. A.

Vestibule and Grille Work of ART METAL Bronze in the Bank of United States, Harlem Branch. L. A. Abramson, Architect; Fleischman Construct'n Co., Contractors

Bronze Entrance Doors by ART METAL in the Bank of United States, Harlem Branch

ART METAL *Bronze in Modern Buildings*

In thousands of banks, public buildings and other edifices, many of them famed internationally for their beauty, the architects have called on ART METAL to interpret their ideals of dignity and beauty in the bronze work.

Whether in bronze doorways and grilles, or steel interior equipment, ART METAL has shown peculiar aptness in producing the warmth and feeling that metal should convey in every beautiful building.

We will be pleased to place at your disposal the result of our third of a century of experience in bronze work, in the form of suggestions, sketches or estimates.

The Booklet, "The Banking House in ART METAL" has been of great interest to architects. We shall gladly send you a copy on request.

Art Metal

JAMESTOWN, NEW YORK

Steel and Bronze Equipment for Banks *Steel Office Equipment, Safes and Files*

DAHLSTROM

WE'RE PROUD OF IT

It's our first elevator door installation and has been in continuous operation since 1906. Many larger installations have followed it; methods of construction have been materially developed and improved; but through it all we can point with pride to the first fruits of our toil because it possessed that element of distinction which is only achieved through an earnest desire to produce the best in a given piece of work. That is still our motive force and Dahlstrom Elevator Inclosures today possess that same element of distinction as in days gone by.

DAHLSTROM METALLIC DOOR CO.

407 Buffalo Street, Jamestown, New York

NEW YORK 25 Broadway — DETROIT 1331 Dime Bank Bldg. — CHICAGO 19 S. La Salle St.

Local Representatives in Principal Cities

DAHLSTROM
ELEVATOR INCLOSURES
IN THE
Wells Fargo Bldg.,
Portland, Ore.

Pages 1394-1399
Portfolio of Detailed Drawings mailed to architects upon request—Filing size

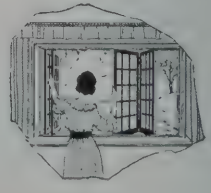
See our Catalogue in SWEET'S

HOFFMAN CASEMENTS

Folding wood casement windows, hinged together in pairs, but not attached to either jamb; providing when set in the position shown, an abundance of fresh air without any direct draft.

Installed to open either in or out, weather tight both ways, clean from inside.

Hoffman Casements are efficient windows for all types of buildings.



Write for illustrated booklet of interest to home builders

Andrew Hoffman Mfg. Co.

Hoffman Casement Window

900 Steger Building
Chicago

VALENTINE'S VALSPAR
The Varnish That Won't Turn White

QUALITY SEEKS COMPANY

A&P

GOODMAN'S FOOD PRODUCTS

SEARS, ROEBUCK AND CO. PHILADELPHIA

Oakland
PRODUCT OF GENERAL MOTORS

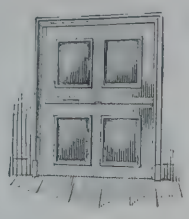
John Hancock
LIFE INSURANCE COMPANY
OF BOSTON, MASSACHUSETTS

James McCreery & Co.

Sitterwoven TOE and HEEL

Cushman's GRADE A BREAD

Mallowtoe Candies



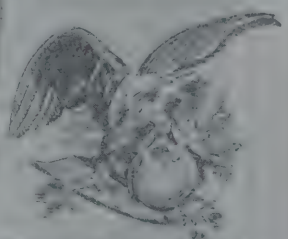
Peelle Kalamein Panelled Counterbalanced Door

THE trade mark symbolizes achievement—it guarantees the quality of the product. Manufacturers, with whom quality is the first consideration, seek also for *quality* in products needed for their own requirements. It is quite natural that Peelle Doors should be installed in the buildings of the concerns represented by these trade marks.

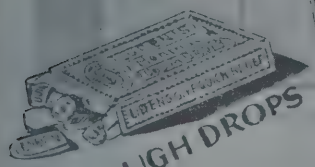
Peelle Freight Elevator Doors are counterbalanced and vertical in operation. Exactness in design eliminates friction, allows smooth and easy operation. Many other features are described in the new Peelle catalog. It will be gladly sent upon request.

THE PEELLE COMPANY, Brooklyn, N. Y.
Boston • Chicago • Cleveland • Philadelphia *and 12 other cities*

PEELLE
COUNTERBALANCED - TRUCKABLE
Freight
ELEVATOR DOORS



THE BROOKLYN DAILY EAGLE



COUGH DROPS

ANSONIA means CLOCKS

CARL FISCHER INC., NEW YORK
COOPER SQUARE
MUSIC

Globe-Wernicke
OFFICE FURNITURE

See our Catalogue in SWEET'S

These mitered corners do not open, because metal does not shrink.

Doorway trimmed with Knapp Flush Metal Casing

Sanitation Pays

THE ample and enduring precautions for sanitation which Knapp Sanitary Metal Trim provides, save many, many dollars—every day, every month, for years and years.

Its *hard surfaces* resist accumulation of dirt and dust. It is set *flush* with walls and flooring—there are no corners or crevices to collect dirt and bacteria beyond the reach of the cleaning cloth.

And so cleanliness, good appearance and healthful surroundings are constantly maintained with great economy.

There is a place for Knapp Sanitary Metal Trim in *every room*—a place where it will save maintenance and upkeep costs and retain that attractive "new and modern" appearance.

Write for complete information.

KNAPP BROTHERS MFG. COMPANY
1343 S. 55th Court . . . . CHICAGO, ILLINOIS

Knapp
SANITARY METAL TRIM
TRADE MARK

FLUSH DOOR CASING • CONCEALED PICTURE MOULD
BULL NOSE METAL CORNER PROTECTOR
FLUSH WINDOW TRIM • FLUSH COVE BASE
FLUSH CHAIR AND BED RAIL

ORIGINATORS OF

SASH CHAINS

Made in

"Giant Metal," "Red Metal" and Steel

North Section of Wrigley Bldg.
Chicago, Ill.

30,000 feet of our No. 2 "RED METAL" SASH CHAIN used in this building.

Our chains are in daily use in most of the prominent school houses, hospitals, hotels, libraries, post offices and office buildings of the United States.

Why Not Use the Best Sash Chain?

SEE PAGE 1335, SWEET'S CATALOG

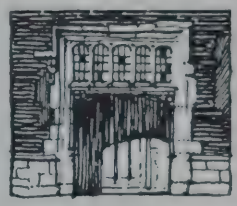
Send for Our Sash Chain Catalog A-1

THE SMITH & EGGE MFG. CO.
BRIDGEPORT, CONN.

HOPE'S CASEMENTS

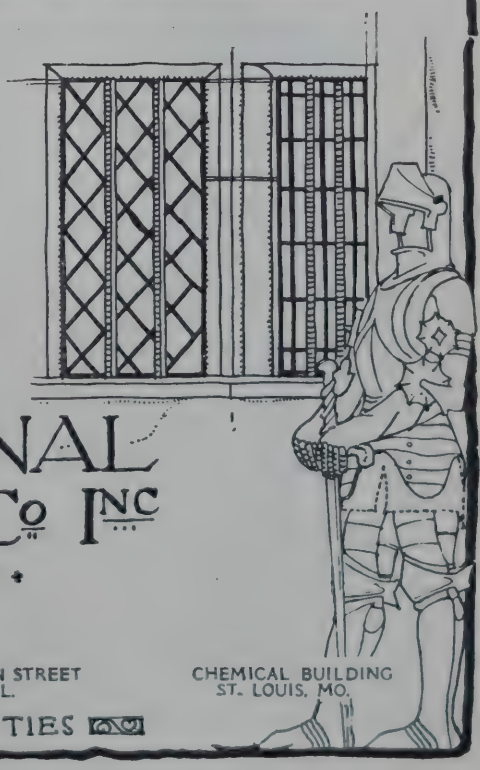
HENRY HOPE & SONS
103 PARK AVENUE NEW YORK

INTERNATIONAL CASEMENTS



Also manufacturers of Austral Windows

INTERNATIONAL Steel Casements are to be seen in this as well as in a number of other recently constructed homes of fraternal organizations. Harmonizing with the architectural design, they have the added advantage of being in every way practicable for this type of building.



INTERNATIONAL CASEMENT Co INC

• JAMESTOWN. NEW YORK •

• SALES OFFICES •

101 PARK AVENUE
NEW YORK CITY

201 DEVONSHIRE STREET
BOSTON, MASS.

58 E WASHINGTON STREET
CHICAGO, ILL.

CHEMICAL BUILDING
ST. LOUIS, MO.

AGENTS IN PRINCIPAL CITIES

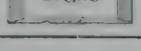
The Equitable Building
[New York]
equipped with 2,200
Athey Perennial
Window Shades

The beautiful Equitable Building in New York, designed by Starrett and Van Vleck, is ***another*** of America's notable new buildings equipped with Athey Perennial Window Shades.

Because they shade the portion of a window that requires shading, without shutting out all the light—because they add a touch of beauty to a building—and because experience has shown that considering their long years of usefulness **they are the most economical shades obtainable**—they have become "standard equipment" in fine buildings of all types—offices, homes, apartments, schools, hotels, hospitals, etc.

Athey Products

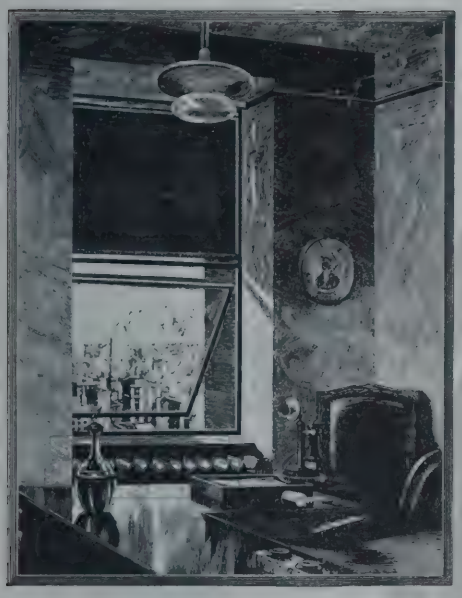
Perennial Window Shades
Cloth-Lined Metal Weatherstrips
Athey Disappearing Partition
Athey Skylight Shades



Write for complete information and prices

Athey Company

6025 West 65th Street · Chicago, Illinois



Its many fine features of serviceability make the Crittall Reversible window, ideal as an office installation

Crittall Reversible Windows are used in the Jefferson Standard Building, Greensboro, N. C., illustrated at right. Chas. C. Hartmann, Architect

CRITTALL

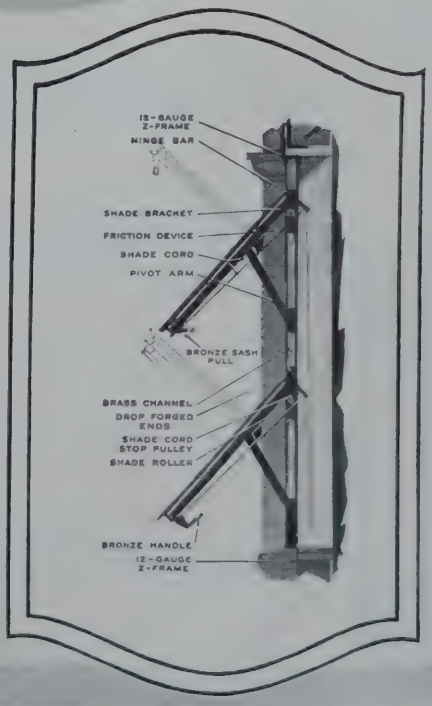
Reversible Windows

With highest utility, fine appearance and superior quality, the Crittall Reversible window also offers a price advantage that cannot fail to impress architects and builders.

It combines maximum light with a wide, easily adjusted ventilating range. It is ideal for schools, hospitals, office buildings, and factory offices. Never out of order. Silent and smooth in operation. Complete reversibility permits windows to be washed from inside. Construction is simple and strong and materials of highest selected quality. This window will last the life of the building without repair or mechanical attention.

The services of our engineers are gladly placed at the disposal of architects for assistance in the solution of unusual window problems.

All Crittall Casements and Windows are Made of Crittalloy—the Copper Bearing Steel

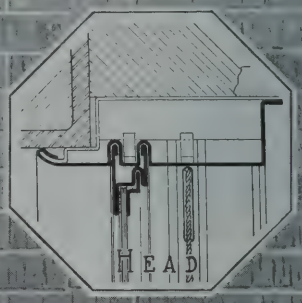


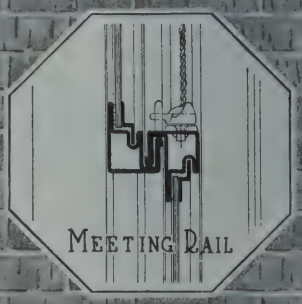
CRITTALL CASEMENT WINDOW CO. · · *Manufacturers* · · DETROIT

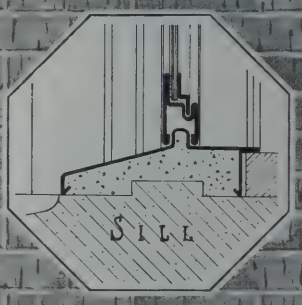
Kawneer WINDOWS

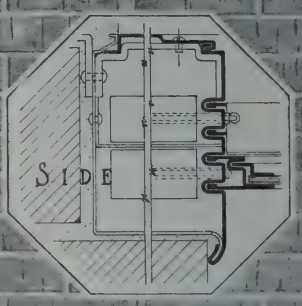
In Solid Nickel-Silver or Copper

Made from Heavy Drawn Metal Mouldings
All Joints Thoroughly Welded









BUILT for PERMANENCY

Kawneer Windows are made of metals that have stood the test of centuries against rust and deterioration.

Sturdy construction gives lasting service and permanent materials assure satisfactory operation with no up-keep cost.

Weight Hung or Casement Types.

Adequate weathering provided by interlocking mouldings for all engaging parts.

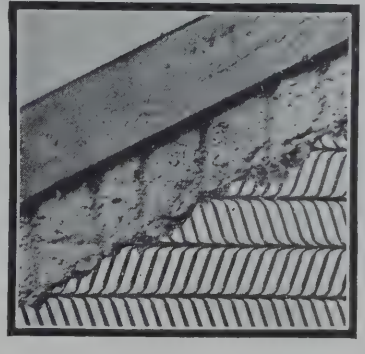
Designed and produced by the makers of KAWNEER SOLID COPPER STORE FRONT CONSTRUCTION.

FULL SIZE DETAILS AND MODELS SHOWN UPON REQUEST

THE Kawneer COMPANY
NILES, MICHIGAN

Furnished apartment, Wardman ParkHotel, Washington, D. C. This 1200 room hotel is Herringbone construction throughout.

Free Forever From Unsightly Cracks



INTERIOR walls constructed with GF Herringbone retain their good appearance. Cracks, sagging and spalling of plaster are eliminated. Original beauty becomes a permanent thing.

The economies possible with Herringbone are worth noting. It is self furring and requires less plaster. Its rigidity makes it easily handled and erected. Labor costs are reduced. And due to the economies of volume production, Herringbone costs no more than ordinary "Key" lath.

You will find the "Herringbone Handbook" filled with usable information. We will gladly mail you a copy on request.

Other GF Materials

Self-Sentering—A combined form, lath and reinforcement.

Trussit—A reinforcement for solid partitions.

GF Expanded Metal—A concrete reinforcement.

GF Steel Tile—For concrete floors.

GF Steel Lumber—Used in place of wood joists and studs.

GF Steel Channels—For fireproof partitions and ceilings.

GF Peds—Spot grounds for attaching trim to concrete and plaster.

GF Waterproofings—For concrete and masonry.

Write for illustrated literature.

THE GENERAL FIREPROOFING CO., *Youngstown, Ohio*

Branches:

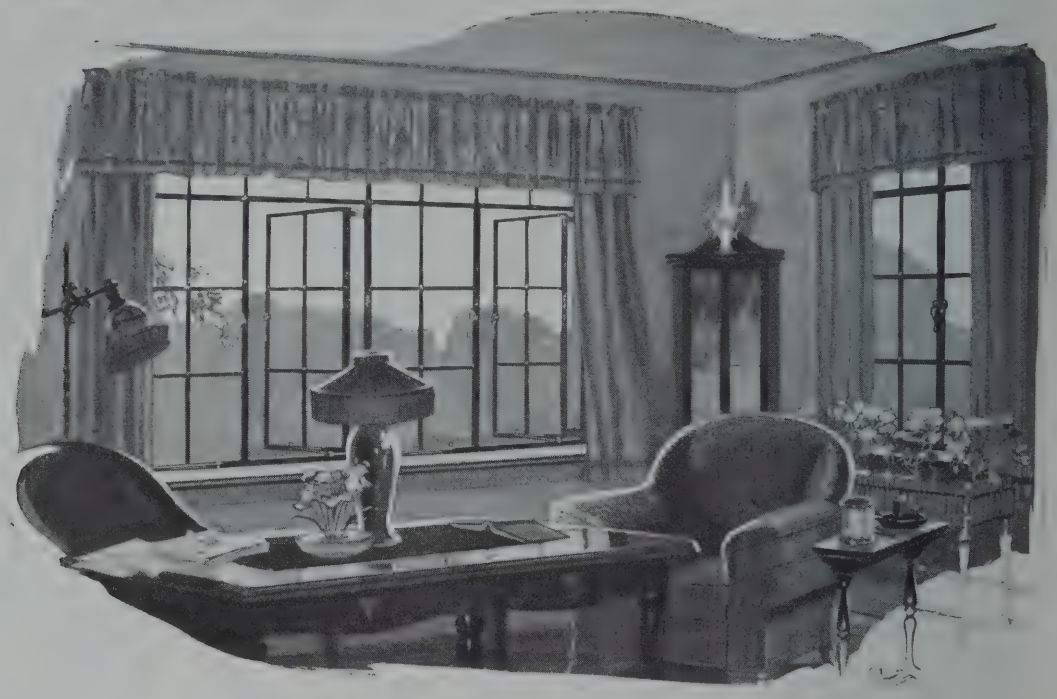
NEW YORK CHICAGO PHILADELPHIA BOSTON CLEVELAND LOS ANGELES ST. LOUIS OMAHA
KANSAS CITY MINNEAPOLIS MILWAUKEE SAN FRANCISCO SYRACUSE ATLANTA MEXICO CITY

Dealers Everywhere : : : : : *Export Department: 438 Broadway, New York City—Cable Address: "Genfire-New York"*

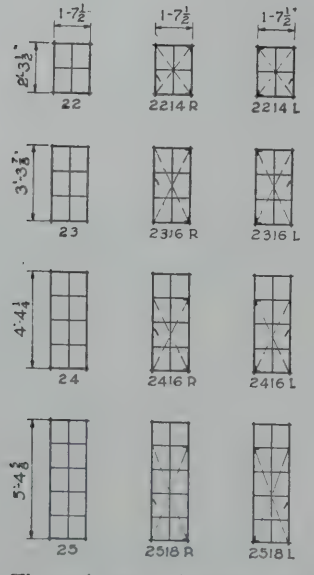
GF Herringbone Rigid Metal Lath

Approved by the Underwriters' Laboratories

REFINED



FENESTRA CASEMENTS



The stock sizes and types of Fenestra Casements shown above are ready for immediate delivery, anywhere. They are supplied in both fixed and ventilated units hinged on both right and left side.

THE delicate lines and beautiful design of Fenestra Casement Windows add to the charm and interest of any home, large or small. The slender bars and small panes of these fine old English Windows become a part of the room decorations themselves, and contribute to the appearance of the home inside and out.

But Fenestra Casements are more than beautiful—they are entirely practical as well. They are made of solid steel and cannot warp or decay. They are weathered by two-point, flat contact all around. They can be washed from inside the building.

Fenestra Casements can be held open at any angle desired, while an attractive handle locks the swing leaves firmly and prevents rattle.

Fenestra Casements are made in a wide variety of styles and sizes all of which are described and illustrated in "Fenestra Casements"—a book prepared for architects. We will gladly send you a copy without any obligation on your part.

DETROIT STEEL PRODUCTS CO., C-2262 E. Grand Blvd., Detroit, Mich.
Division of Architectural Construction

[BRILLIANT.....DIFFUSIVE.....BEAUTIFUL]

MISSOURI PACIFIC HOSPITAL, St. Louis, Mo. C. H. Wray, *Architect.* E. M. Tucker, *Supervising Architect.*
Tapestry Glass, double-process chipped, used in all windows in rotunda.

Many notable architects specify

TAPESTRY GLASS

Tapestry Glass obscures vision, breaks up direct rays of light and diffuses them in a clear and brilliant flood. By a special exclusive process the surfaces are given a smoothly rounded texture, not unlike fine fabric. These surfaces collect and transmit the maximum of light through the body of Tapestry Glass, which has all the purity and clarity of the finest plate.

Tapestry Glass is now used for windows, partitions, doors and other openings in many of the newest and finest buildings in all parts of the country. For residences, banks, churches, schools, fraternal buildings—wherever the maximum of light is necessary and privacy is desirable Tapestry Glass is now specified by many of the leading architects.

Designs to conform with any architectural plan may be permanently and inexpensively chipped, ground or mitred upon the surface. Names, numbers, trade-marks or crests also look remarkably well when done in this manner. Where necessary, the entire surface of Tapestry Glass, or the background of a design, may be chipped or sand-blasted for opacity before installation.

Investigate the possibilities of Tapestry Glass through the nearest glass dealer or write for catalog and samples to the Pittsburgh Plate Glass Company.

PITTSBURGH PLATE GLASS CO.
GLASS VARNISH PAINT

MISSISSIPPI - WIRE - GLASS - CO.
FIRE RETARDANT No. 32

THE WOOLWORTH BUILDING
Cass Gilbert, Architect
Thompson-Starrett Co., Contractors
A Wire Glass installation from the Western Union Building through a Polished Wire Glass installation.

MISSISSIPPI WIRE GLASS CO.
220 Fifth Avenue, New York
St. Louis Chicago

Use PLATE Glass ©

Makes all the difference in the world

Genuine PLATE GLASS
MADE IN U.S.A.

Nothing Else is Like it ©

Wilson

An Essential Feature of School Hygiene

WILSON Rolling Front Wardrobes save space and construction cost, eliminating the need of cloakrooms. They provide ample room for pupils' clothing as well as being thoroughly ventilated. The fronts roll upward, out of sight and out of the way. Additional blackboard surface may be provided, if required.

Ask us for 40-page catalog No. 3

The J. G. WILSON Corporation
11 East 36th Street, New York City

Our 400 page catalog is valuable to buyers of new installations, also to those interested in replacements. Write for your free copy.

Consult us without the least obligation on your part. A letter today will help you with your food problems.

Van Kitchen Equipment

Installed in the Ford Hospital (Detroit)

Van Installation for the Preparation and Serving of Food again selected because of its superiority.

"That Enduring Quality"

is insisted upon by leading Hotels, Hospitals and Institutions, who demand the best obtainable in Kitchen and Dining Room Equipment.

Through three quarters of a century, our Engineers have kept abreast with all that is new and good for our customers; and you are at liberty to consult them at all times regardless of the size of your needs.

CHICAGO
LOUISVILLE
KANSAS CITY
CLEVELAND
NEW ORLEANS

The John Van Range Co.

EQUIPMENT FOR THE PREPARATION AND SERVING OF FOOD

Cincinnati

BUFFALO
ATLANTA
DETROIT
PITTSBURGH
MUSKOGEE

ANNOUNCING
the opening of the new thirty-two story Straus Building, Michigan Ave. at Jackson Boulevard, Chicago, home of our Western Headquarters.

S. W. STRAUS & CO.

ESTABLISHED 1882 INCORPORATED

STRAUS BUILDING
565 Fifth Ave. at 46th St.
NEW YORK

STRAUS BUILDING
79 Post Street
SAN FRANCISCO

STRAUS BUILDING
Michigan Ave. at Jackson Blvd.
CHICAGO

42 YEARS WITHOUT LOSS TO ANY INVESTOR

SERVICE SECTION
of THE ARCHITECTURAL FORUM

Information on economic aspects of construction and direct service for architects on subjects allied to building, through members of THE FORUM Consultation Committee

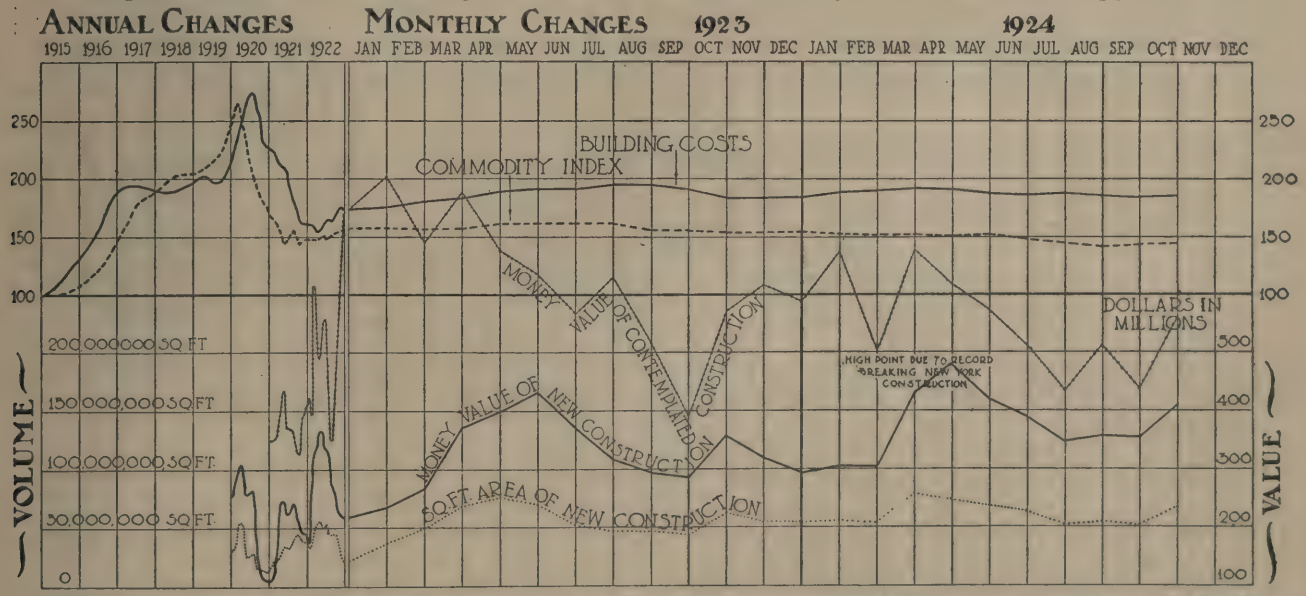
The Building Situation

AS indicated in the chart below, the expected increase in October building activity has been shown by a total value of new building contracts during the month amounting to $410,090,800. This is the F. W. Dodge Corporation's figure for territory representing practically seven-eighths of the country and records an increase of 14 per cent over October of last year and 19 per cent over the preceding month, September, 1924.

This increase occurred principally in New York and New Jersey, where there was an increase of 31 per cent over September and 1 per cent over October of last year. In New England new building was 3 per cent higher than September and equal to October, 1923. In the Middle Atlantic States, October showed a 22 per cent increase over September and a 77 per cent increase over October, 1923. Other increases included the Southeastern States, 41 per cent over September and 60 per cent over October, 1923; the Central West, 16 per cent over September and 12 per cent over the previous October, and the Northwest, 33 per cent over September, but 11 per cent under October, 1923. The Pittsburgh district showed a slowing down of activity, being 12 per cent less than September and 18 per cent less than the previous October. It is quite evident by the nature of contracts let and plans filed that an unusual amount of winter construction is being undertaken. This trend toward the reduction of seasonal peaks is gratifying and will contribute strongly to the economic welfare of the country and of the building construction industry.

The charts on the next page show that residential building still contributes heavily to the grand total of building activity. This field includes not only dwellings but apartment buildings and hotels. Each month of this year has shown the highest total ever known for the same month in any recorded year, and yet rentals hold their high levels and the vast volume of new housing is quietly and quickly absorbed by the public. Commercial and industrial buildings are also again contributing an increased quota of new construction, while club and recreational building is unusually active.

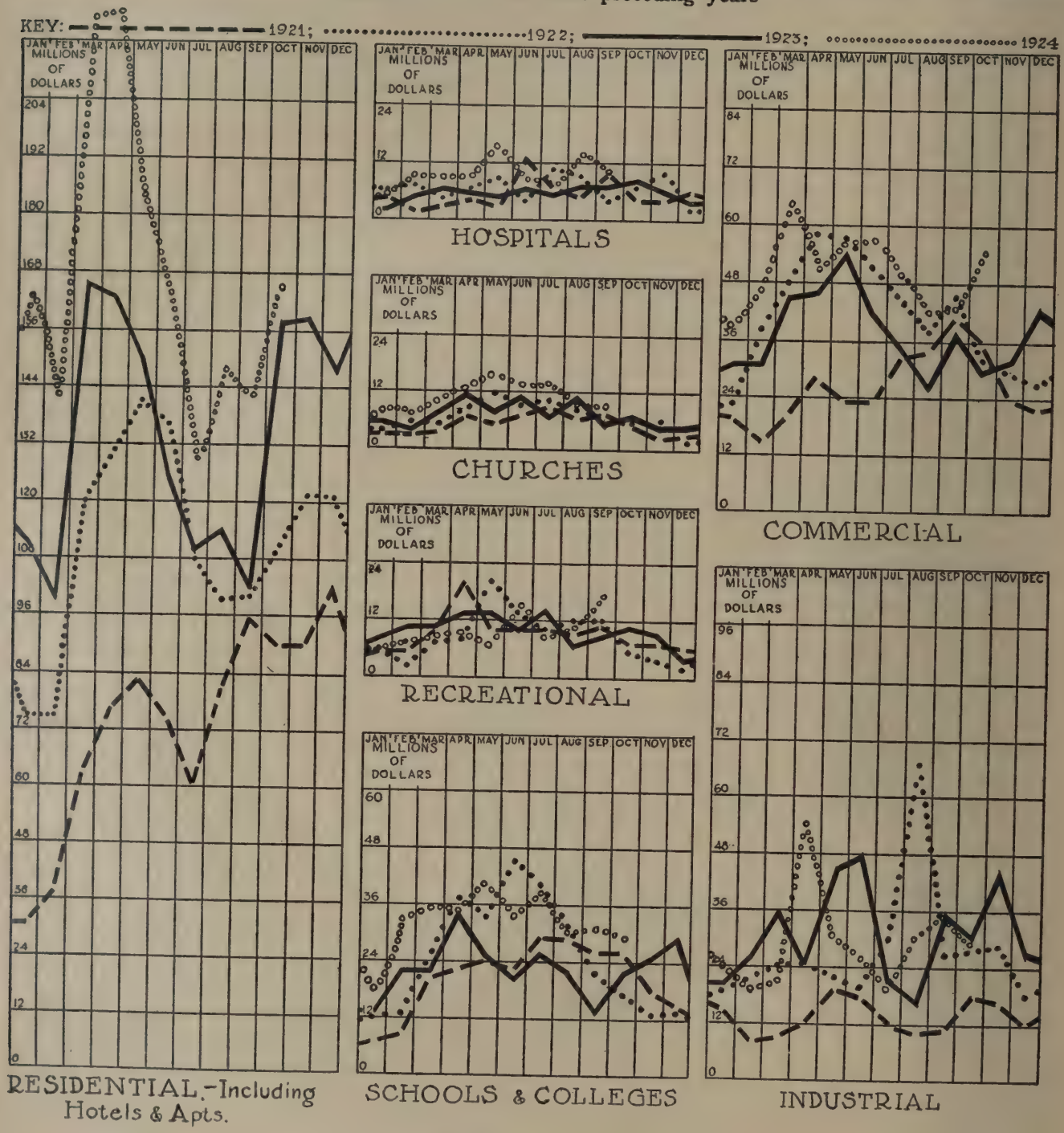
Building costs are stabilizing in a manner which is encouraging many new projects into early stages of construction, and mortgage money remains plentiful with fairly liberal terms and appraisals usual.



THESE various important factors of change in the building situation are recorded in the chart given here: (1) *Building Costs.* This includes the cost of labor and materials; the index point is a composite of all available reports in basic materials and labor costs under national averages. (2) *Commodity Index.* Index figure determined by the United States Department of Labor. (3) *Money Value of Contemplated Construction.* Value of building for which plans have been filed based on reports of the United States Chamber of Commerce, F. W. Dodge Corp., and *Engineering News-Record.* (4) *Money Value of New Construction.* Total valuation of all contracts actually let. The dollar scale is at the right of the chart in millions. (5) *Square Foot Area of New Construction.* The measured volume of new buildings. The square foot measure is at the left of the chart. The variation of distances between the value and volume lines represents a square foot cost which is determined first, by the trend of building costs, and second, by the quality of construction.

Monthly Analysis of the Trend of Building Activity

A study of the value of contracts let each month in seven important types of buildings—with graphic comparisons for the three preceding years



OCTOBER 1924 CONTRACTS

IN order that a comparison of monthly activity may be made at a glance, the value of contracts let is presented in the above graphic charts. This information is based on data obtained through the United States Chamber of Commerce and the F. W. Dodge Corporation. The activity of each year is shown by a special line according to the key indicated at the top of the page. Thus, on each chart the activity in the form of Money Value of Contracts Let may be followed through from January, 1921, to the most recent month for which figures were available when this page was printed. Not only is a rapid comparison provided of the total activity each year, but the relative activity for each month can be estimated by referring to the index figures representing millions of dollars as shown at the left of each chart. Reports cover about three-quarters of the total building in the United States.

BUILDING MATERIAL PRICES

Table Showing Average Prices Paid by Contractors for Building Materials at Local Distributing Points as of October 1, 1924. Prepared by Division of Building and Housing of the Bureau of Standards from Prices Secured through the Bureau of Census

Commodities	Size or Condition	Unit	Fitchburg	Haverhill	Fall River	New London	Pittsburgh	Erie	Scranton	Baltimore	Washington	Richmond	Fairmont	Columbia	Savannah	Detroit	Saginaw	Bay City	Grand Forks	Sioux Falls
Common Brick		1,000	22.00	22.00	22.00	27.00	17.00	....	26.00	20.00	....	17.00	24.00	12.00	14.00	17.50	15.50	17.00	13.50	18.00
Portland Cement	Excl. of containers	Bbl.	2.67	3.20	2.96	3.43	2.85	3.40	3.00	3.00	2.60	3.35	2.85	3.35	3.25	3.40	2.60	2.50	3.40	2.80
Yellow Pine No. 1	Dimensions 2x4-16′ S1S1E	M	....	55.00	....	....	47.00	49.00	....	37.50	....	32.00	....	....	30.00	43.00	45.00	40.00	....	....
Douglas Fir No. 1	Dimensions 2x4-16′ S1S1E	M	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	40.00	43.00
N. Carolina Pine No. 1	Dimensions 2x4-16′ S1S1E	M	....	....	....	....	....	50.00	....	....	....	32.00	50.00	25.00	....	43.00	45.00	....	....	....
Common Boards No. 1	1x6	M	50.00	45.00	....	45.00	45.00	....	....	38.00	....	35.00	48.00	25.00	30.00	43.00	40.00	38.00	40.00	45.00
Y.P. Flooring Edge Grain "C"	1x4-10′-16′	M	100.00	110.00	....	110.00	103.00	....	....	130.00	....	110.00	100.00	85.00	....	....	70.00	80.00	....	....
Douglas Fir V. G. No. 2	1x4-10′-16′	M	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	76.00	80.00
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	6.25	6.20	....	6.00	6.25	6.80	....	10.40	....	6.20	7.25	7.50	....	6.50	7.00	6.50	4.50	4.80
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	....	....	....	....	6.75	6.50	....	....	....	5.48	6.50	7.25	6.25	7.00	6.50	5.90	8.10	7.50
Gypsum Plaster Board	⅜″	1,000 sq. ft.	....	45.00	....	50.00	37.50	45.00	32.50	45.00	30.00	37.50	32.00	....	55.00	30.00	45.00	40.00	....	32.00
Lime	Hyd.	Ton	24.00	20.00	23.00	26.00	22.00	22.00	22.00	14.25	15.00	17.50	16.00	18.50	20.00	20.00	18.00	18.00	24.00	24.00
Building Sand		Cu. yd.	1.80	2.00	1.75	1.50	2.50	2.50	....	1.70	....	1.40	3.50	1.25	2.00	2.75	2.50	2.25	2.70	1.20
Crushed Stone	¾″	Ton	3.25	2.50	2.00	....	6.00	3.00	....	....	....	2.35	3.00	2.75	....	2.35	3.25	3.25	....	2.70
Wire Nails		Keg	4.05	4.40	....	4.75	3.40	....	....	3.50	....	3.75	4.20	3.75	3.80	3.55	3.75	3.60	5.80	5.00
Window Glass	Single A 10″x12″	50 sq. ft.	4.00	4.15	....	4.27	5.95	....	....	3.90	....	5.80	4.25	....	....	....	5.50	5.00	5.10	5.40
Hollow Tile	8″x12″x12″	Each	....	.30	.20	.30	.18	.21	.25	.20	....	.20	.24	.17	.15	.20	.19	.18	.11	.19
Cast Iron Soil Pipe	4″ E.H. 13 lbs. per ft.	Ton	....	....	....	....	69.21	....	....	55.40	....	64.90	75.00	....	....	....	60.00	61.50	....	....
Steel Pipe	1″ galv.	100 ft.	....	....	....	....	9.86	....	....	9.88	....	10.00	11.00	11.68	....	....	11.50	10.50	....	....
Reinforcement Bars	¾″ square	100 lbs	3.50	4.00	....	....	3.18	....	....	3.25	3.65	3.50	3.50	4.25	....	3.75	3.65	3.60	....	....
Structural Steel	Fab. 6″ I-beams	100 lbs	5.50	5.50	....	....	3.00	....	....	3.37	....	4.00	5.00	4.75	....	5.50	5.00	4.65	....	....
White Lead	Dry	100 lbs	....	14.00	....	13.78	15.00	....	....	13.20	....	14.75	14.25	15.50	15.00	....	14.50	14.25	14.50	....
Zinc Oxide	Am. process lead free	100 lbs	....	....	....	....	15.00	....	....	....	....	....	....	17.50	15.00	....	15.00	15.00	....	....
Gypsum Plaster	Neat	Ton	24.00	24.00	....	26.00	20.00	20.00	21.00	18.00	19.00	20.00	20.00	18.00	21.50	19.00	18.00	16.40	21.00	14.50
Linseed Oil	Raw in bbls	Gal.	....	1.12	....	1.07	1.02	....	....	1.05	....	1.08	1.20	1.23	1.04	....	1.10	1.05	....	1.05
Roofing Slate	No. 1 ribbon	100 sq. ft.	....	17.00	....	....	14.25	....	....	....	....	11.50	13.00	....	....	....	17.00	16.50	....	....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	....	2.60	....	....	....	....	....	....	....	....	....	....	1.75	2.75	2.75	2.50	2.90	3.75
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	....	1.60	....	....	1.10	1.20	....	....	....	....	1.50	....	1.00	1.20	1.25	1.20	1.80	1.50

Commodities	Size or Condition	Unit	Albany	Schenectady	Syracuse	Rochester	Akron	Cleveland	Toledo	Lorain	Jacksonville	Madison	Waterloo	Rockford	Portland, Ore.	Spokane	Seattle	Kansas City	San Antonio	Tucson	Denver
Common Brick		1,000	18.00	22.50	20.00	18.75	16.00	14.00	....	21.00	16.00	15.00	16.50	16.00	17.00	16.50	15.00	16.50	17.50	15.00	14.00
Portland Cement	Excl. of containers	Bbl.	3.34	3.20	3.30	3.35	3.20	3.00	3.40	3.20	3.40	3.15	2.80	2.80	3.00	3.13	3.00	2.50	3.60	3.90	3.40
Yellow Pine No. 1	Dimensions 2x4-16′ S1S1E	M	....	45.00	52.00	46.00	45.00	58.00	43.00	55.00	40.00	....	45.00	54.00	....	....	....	48.00	55.00	....	....
Douglas Fir No. 1	Dimensions 2x4-16′ S1S1E	M	....	45.00	....	....	....	....	....	....	....	47.00	45.00	54.00	22.50	25.00	20.00	48.00	....	55.00	40.00
N. Carolina Pine No. 1	Dimensions 2x4-16′ S1S1E	M	....	....	42.00	46.00	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....
Common Boards No. 1	1x6	M	....	45.00	40.00	40.00	45.00	48.00	43.00	50.00	....	45.00	40.00	47.00	22.50	....	19.00	50.00	55.00	50.00	39.00
Y.P. Flooring Edge Grain "C"	1x4-10′-16′	M	....	120.00	105.00	110.00	....	98.00	....	105.00	....	115.00	96.00	82.00	....	....	....	105.00	105.00	....	110.00
Douglas Fir V. G. No. 2	1x4-10′-16′	M	....	....	90.00	....	....	....	....	....	....	85.00	94.00	94.00	55.00	70.00	54.00	....	....	80.00	75.00
Red Cedar Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	....	6.40	6.25	6.00	6.00	6.60	5.40	....	7.20	5.40	6.00	5.80	4.00	3.50	3.50	5.00	....	....	5.25
Cypress Shingles	Extra clear 16″ 5 to 2	100 sq. ft.	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	....	6.50	....
Composition Shingles	Crushed slate surfaced	100 sq. ft.	....	6.75	6.00	....	6.50	....	6.00	....	6.00	7.00	6.50	....	....	....	....	6.25	....	....	....
Gypsum Plaster Board	⅜″	1,000 sq. ft.	31.50	37.50	32.50	30.00	26.00	32.00	45.00	....	45.00	30.00	34.00	30.00	38.00	....	35.00	35.00	47.50	....	42.00
Lime	Hyd.	Ton	19.80	....	20.00	20.00	20.00	16.00	20.00	17.50	20.00	17.50	20.00	22.00	26.00	27.50	22.00	24.00	20.00	....	22.00
Building Sand		Cu. yd.	....	2.50	1.80	2.00	2.00	2.50	3.04	2.40	3.50	2.70	1.50	2.25	2.00	....	1.85	....	2.25	1.25	1.50
Crushed Stone	¾″	Ton	....	3.80	2.25	2.85	3.00	3.50	3.00	2.65	4.80	2.15	2.75	1.80	....	....	....	....	2.75	3.50	2.60
Wire Nails		Keg	....	4.60	4.10	4.25	3.45	3.55	3.75	3.80	4.00	4.00	4.25	4.50	4.50	4.65	4.00	3.65	5.50	5.50	5.25
Window Glass	Single A 10″x12″	50 sq. ft.	....	....	4.50	4.20	4.50	....	....	....	4.15	....	5.25	....	5.00	3.84	4.25	4.50	4.17	....	4.80
Hollow Tile	8″x12″x12″	Each	.27	....	.25	.19	.16	....	....	.18	.16	....	.16	.17	.19	....	.20	.16	.22	.18	.17
Cast Iron Soil Pipe	4″ E.H. 13 lbs. per ft.	Ton	....	....	....	59.60	64.32	....	....	....	....	58.44	79.98	72.38	96.00	95.40	94.00	89.24	80.99	....	81.00
Steel Pipe	1″ galv.	100 ft.	....	....	10.51	10.52	10.36	....	....	....	11.77	15.00	12.00	10.85	....	11.30	11.30	13.00	10.51	....	12.58
Reinforcement Bars	¾″ square	100 lbs	....	3.75	3.50	3.40	3.75	....	....	3.35	3.50	3.25	3.40	3.20	4.00	4.00	3.00	2.96	3.60	....	3.85
Structural Steel	Fab. 6″ I-beams	100 lbs	....	5.00	4.50	3.50	3.25	....	....	2.95	....	4.00	4.95	3.30	5.00	....	5.50	4.40	4.25	5.00	4.50
White Lead	Dry	100 lbs	....	....	14.25	13.28	14.75	15.00	14.50	....	15.25	15.50	14.50	14.25	16.00	14.75	12.00	14.88	14.18	15.75	16.13
Zinc Oxide	Am. process lead free	100 lbs	....	....	....	....	15.00	....	....	....	....	14.50	14.75	....	....	16.00	13.00	....	....	....	....
Gypsum Plaster	Neat	Ton	20.00	17.80	19.25	18.00	19.00	....	20.00	16.50	22.00	18.00	18.00	17.50	20.00	....	20.00	17.00	22.00	20.00	19.00
Linseed Oil	Raw in bbls	Gal.	....	....	1.15	1.22	1.07	1.08	1.25	....	1.00	1.35	1.15	1.33	1.17	1.12	1.24	1.09	1.08	....	1.20
Roofing Slate	No. 1 ribbon	100 sq. ft.	....	....	14.00	13.00	13.50	....	....	....	....	16.50	18.00	15.00	....	....	....	15.00	20.00	....	....
Tar Paper, Roofing	2-ply 75 lbs. per roll of	100 sq. ft.	....	....	2.25	2.50	2.35	2.50	....	....	2.25	2.25	2.85	2.00	....	....	....	....	....	3.00	....
Rosin Sized Sheathing	3-ply 30 lbs. per roll of	500 sq. ft.	....	1.75	1.50	1.35	....	.90	....	....	.85	1.25	1.40	1.50	1.30	1.20	1.20	....	1.90	1.75	1.65

THE FORUM CONSULTATION COMMITTEE

A group of nationally known experts on various technical subjects allied to building, providing a direct service to architects

THE editors of THE ARCHITECTURAL FORUM have been fortunate in obtaining the coöperation of the following recognized experts who constitute THE FORUM Consultation Committee. This Committee provides a service of the greatest value to subscribers in addition to the usual editorial service, and architects who seek information on specific questions in these various fields are invited to present inquiries regarding any of these subjects.

The basis on which this Committee has been organized is:

(*a*) That each committee member shall be a representative leader in his line;

(*b*) That no committee member has affiliations with any manufacturer;

(*c*) That no committee member will be called upon for detailed service excepting by special arrangement;

(*d*) That a special editorial article on a subject represented under each of the headings below shall be prepared during the year by the committee member.

SUBJECTS AND COMMITTEE PERSONNEL

HOTEL DESIGN AND EQUIPMENT

DANIEL P. RITCHEY

Known in the hotel field as the "hotel doctor," Mr. Ritchey, who is an engineer as well as an experienced hotel owner and manager, is qualified to answer any questions which may arise in this connection.

HEATING AND VENTILATING

CHARLES A. FULLER

Consulting, Heating and Ventilating Engineer

Member of firm of Griggs & Myers, New York. Widely experienced in the field of heating and ventilating design for office, institutional and industrial buildings; specialist on investigation and report work on mechanical equipment for new and old plants.

ELECTRICAL SCIENCE

WILLIAM L. GOODWIN

Vice-president of the Society for Electrical Development

This Society is organized to promote accurate knowledge of the practical application of electricity. Its activities extend from the simple problems of household equipment to highly developed electrical plants. Particular attention is given the development of provision for electrical service in buildings.

SAFETY ENGINEERING

S. J. WILLIAMS

Secretary and Chief Engineer, National Safety Council, Chicago

Safety engineering is an important factor in the design of buildings where large groups of people congregate. The National Safety Council has investigated construction and devices with the greatest minuteness.

FINANCE

WALTER STABLER

Comptroller, Metropolitan Life Insurance Co.

The largest institution in the United States making loans for building construction. Mr. Stabler's knowledge of building investments covers the country and is widely recognized.

REAL ESTATE

C. STANLEY TAYLOR

Widely experienced in real estate development and financing, real property law, architecture, engineering and building construction. Financial and Business Editor of THE ARCHITECTURAL FORUM.

FIRE PROTECTION ENGINEERING

J. D. HUNTER

Chief Engineer, Marsh & McLennan, Insurance Brokers, New York

Specialist in insurance engineering as applied to building design, construction and equipment.

BUILDING MANAGEMENT

J. CLYDESDALE CUSHMAN

President, Cushman & Wakefield, Inc., Real Estate, New York

Mr. Cushman's firm has participated largely in the promotion and operation of many large New York buildings. His own specialty is the management of office buildings.

GAS SERVICE AND UTILIZATION

NILS T. SELLMAN

Service Engineer, American Gas Association

A specialist in problems pertaining to gas service and its use in all classes of buildings and industries.

Address inquiries to committee members, care THE ARCHITECTURAL FORUM, 383 Madison Avenue, New York

Selected List of Manufacturers' Publications

FOR THE SERVICE OF ARCHITECTS, ENGINEERS, DECORATORS, AND CONTRACTORS

The publications listed in these columns are the most important of those issued by leading manufacturers identified with the building industry. They may be had without charge, unless otherwise noted, by applying on your business stationery to *The Architectural Forum*, 383 Madison Ave., New York, or the manufacturer direct, in which case kindly mention this publication.

ACOUSTICS

Johns-Manville, Inc., Madison Ave. & 41st St., New York, N. Y.
Architectural Acoustics. Booklet. 6 x 9 in. 24 pp. Illustrated. Treatise on the correction of architectural acoustics in churches, schools, hospitals, office buildings and other places.

Macoustic Engineering Company, Inc., 323 Bulkley Building, Cleveland, Ohio.
Acoustics. Folder. 3¼ x 6¼ in. 2 pp. Not illustrated. Contains brief account of the care in the selection of the architect for the Cleveland Public Hall; the reasons for selecting him; and brief reference to "Sound Direction and Control" principles.
Offering to Architects. Folder. 8½ x 11 in. 2 pp. Illustrated. Contains comments on acoustics of the Cleveland Auditorium by leading artists; list of buildings treated by Macoustic "Sound Direction and Control" principles; many features as to application, appearance, color treatment, financial saving, and complete explanation of engineering service.
Expanding Macoustic. Folder. 7¼ x 10 in. 1 Sheet. Illustrated. A sheet containing information as to how an architect can avail himself of the engineering service which we have to offer.

ASH HOISTS—ELECTRIC AND HAND POWER

Gillis & Geoghegan, 544 West Broadway, New York, N. Y.
General Catalog. 8½ x 11 in. 20 pp. Fully illustrated. Contains specifications in two forms (with manufacturers' name and without). Detail ¼ in. scale for each telescopic model and special material-handling section.
The Man-Saving Load Lifter. 5⅞ x 8⅞ in. 8 pp. Illustrated. Describes G&G Telescopic and Non-Telescopic Hoists for handling material in factories.

BATHROOM ACCESSORIES

The Fairfacts Company, 234 West 14th St., New York, N. Y.
Catalog F. 4 x 9 in. 12 pp. Illustrated. Describes full line of china fittings for bathrooms.
The Perfect Bathroom. Booklet. 3 x 9 in. 12 pp. Illustrated. Shows full line, Biltin and Projecting Types, installed. For architects and clients.

BOILERS—See Heating Equipment

BRICK

Acme Brick Company, Ft. Worth, Tex.
Series No. 1
Architectural designs rendered in Acme Brick. Booklet. 11 x 8½ in. Illustrated. A series of 48 photogravures showing architectural designs rendered in Acme brick. Illustrations show the various types of buildings erected in the Southwest in recent years. Sent free to architects applying on their office stationery.

American Face Brick Association, 1751 Peoples Life Bldg., Chicago, Ill.
The Story of Brick. Third Edition. Booklet. 7 x 9¼ in. 55 pp. Illustrated. Presents the merits of face brick from structural and artistic standpoints. Tables of comparative costs.
The Home of Beauty. Fourth Edition. Book. 8 x 10 in. 72 pp. Color plates. Presents fifty designs for small face brick houses submitted in national competition by architects. Text by Aymar Embury II, Architect. Price 50c.
Bungalow and Small House Plans. Booklet. 8½ x 11 in. 50 pp. Illustrated. Four booklets, showing a variety of designs for small face brick houses, covering 3, 4, 5, 6, 7 and 8 room houses. Price, 25c. each, $1 for the set.
A Manual of Face Brick Construction. Booklet. 8½ x 11 in. Textbook on construction of the brick wall and various uses of face brick. 31 colored plates of brick houses with plans. Price, $1.00.
Architectural Details in Brickwork. Series 1, 2, 3. 8½ x 11 in. Very useful to the architect or draftsman. Sent free to architects applying on their office stationery. To others $1.50.

BUILDING FINANCE

S. W. Straus & Co., 565 Fifth Ave., New York, N. Y.
Forty-two Years without Loss to Any Investor. Booklet. 8 x 5 in. 38 pp. Illustrated. A carefully prepared booklet for the thinking investor. Describes Straus bonds, the property upon which loans are made, and explains the Straus plan of safeguards which made possible the 42-year record.

BUILDING STONE—See Stone, Building

BUILDING, STANDARD STEEL

Truscon Steel Company, 250 W. Lafayette Blvd., Detroit, Mich.
Truscon Standard Building Catalog. 8½ x 11 in. 48 pp. Contains data and illustrations.

BUILDING, STEEL PRODUCTS FOR

Massillon Steel Joist Company, The, Massillon, Ohio.
Massillon Bar Joists. Pamphlet. 8½ x 11 in. 8 pp. Illustrated. Pamphlet containing general information descriptive of Massillon Bar Joist Fireproof Floor Construction, with cuts showing methods of construction and photographs of installations.
Detailed Dimensions, Safe Loading Tables, Details of Construction. Catalog. 8½ x 11 in. 32 pp. Illustrated.
Catalog contains complete detailed information about each Massillon Bar Joist Structural Unit.

Truscon Steel Company, 250 W. Lafayette Blvd., Detroit, Mich.
Truscon Data Book. Catalog. 3½ x 6 in. 128 pp. Illustrated. Contains complete information with illustrations on Truscon reinforcing steel, steel windows, metal lath, standard buildings, concrete inserts, steel joists, pressed steel stamping and chemical products.

CARPETS, IMPORTED

Kent-Costikyan Trading Company, Inc., 484 Fifth Ave., New York, N. Y.
Rugs. Catalog. 9½ x 6½. 56 pp. Illustrated. Illustrates and describes an unusual collection of Oriental and Occidental rugs with stock list.

CEMENT

Carney Company, The, Mankato, Minn. Booklet. 8 x 10 in. 24 pp. Illustrated. Complete information on product, showing prominent buildings in which this cement has been used.
Booklet. 8½ x 11 in. 8 pp. Illustrated. Attractive circular describing late improvements in manufacturing Carney; cost comparisons, physical tests, specifications and testimonials. Contains four-page list of Carney-built buildings in all parts of the United States with architects' and contractors' names.

Louisville Cement Co., 315 Guthrie St., Louisville, Ky.
Brixment. Booklet. 7½ x 5 in. 16 pp. Illustrated. Brixment, what it is, what it does, how it does it and why.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa Waterproof White Portland Cement. Booklet. 8½ x 11 in. 32 pp. Illustrated.
Medusa Integral Waterproofing Powder and Paste. Booklet. 8½ x 11 in. 88 pp. and cover.

CONDUIT

National Metal Molding Co., 1113 Fulton Building, Pittsburgh, Pa.
Bulletin of all National Metal Molding Products. In correspondence folder. 9½ x 11½ in.
Sheraduct. Circular. 5 x 8 in. Illustrated.
Flexsteel. Circular. 5 x 8 in. Illustrated.

CONSTRUCTION, FIREPROOF

Massillon Steel Joist Co., Massillon, Ohio.
Massillon Bar Joists. Brochure. 8½ x 11 in. Illustrated. Full data regarding the steel used for construction of floors in fireproof buildings of various kinds.

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Fire Proofing Bulletin 171. 8½ x 11 in. 32 pp. Illustrated. A treatise on fireproof floor construction.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction Catalog. 6 x 9 in. 72 pp. Illustrated. Handbook of practical suggestions for architects and contractors. Describing Nemco Expanded Metal Lath.

DAMPPROOFING

Philip Carey Co., Lockland, Cincinnati, Ohio.
Architects' Specifications for Carey Built-Up Roofing. Booklet. 8 x 10¾ in. 24 pp. Illustrated. Complete data to aid in specifying the different types of built-up roofing to suit the kind of roof construction to be covered.
Carey Built-Up Roofing for Modern School Buildings. Booklet. 8 x 10¾ in. 32 pp. Illustrated. A study of school buildings of a number of different kinds and the roofing materials adapted for each.

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York.
Specification Sheet. 8½ x 11 in. Descriptions and specifications of compounds for dampproofing interior and exterior surfaces.

DOORS AND TRIM, METAL

The American Brass Company, Waterbury, Conn.
Illustrated pamphlet describing use and adaptability of Extruded Architectural Bronze Shapes for metal window frames, doors, grilles, counter screens, etc.

The Compound & Pyrono Door Company, St. Joseph, Mich.
Pyrono Handbook for Architects and Contractors. 8½ x 11 in. 16 pp. Contains full information regarding Pyrono Fireproof Veneered Doors and Trim, with complete details and specifications.
Pyrono details in sheet form for tracing.

Dahlstrom Metallic Door Company, 425 Buffalo St., Jamestown, N. Y.
Architectural Catalog. 10 x 14 in. 46 pp. 11 sections. Illustrated. Catalog showing the regular styles and types of hollow metal doors and interior trim. Various types of frames and other architectural shapes also illustrated.
Buildings as They Should Be. Booklet 7½ x 10½ in. A lavishly illustrated publication giving data and views of buildings of different kinds equipped with Dahlstrom doors and trim.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Fire Doors and Hardware. Booklet. 8½ x 11 in. 64 pp. Illustrated. Describes entire line of tin-clad and corrugated fire doors, complete with automatic closers, track hangers and all the latest equipment—all approved and labeled by Underwriters' Laboratories.

DOORS—SERVICE

Servidor Company, The, 101 Park Ave., New York, N. Y.
The Steel Servidor. Specifications, Data, Details and Description. Size 8½ x 11 in. 8 pp.
Advantages of Servidor Service. Summarizes Servidor Service, outlines its merits and advantages and new revenue-producing power. Size 8½ x 11 in. 8 pp.
Bulletin A-3—The Eternal Tip. Size 6½ x 9 in. 8 pp.
Bulletin A-8—Servidors as an Investment. Size 6½ x 9 in. 8 pp.

DRAFTING MATERIALS

American Lead Pencil Company, 220 Fifth Ave., New York, N. Y.
VENUS Pencil in Mechanical Drafting. Booklet C20. 6 x 9 in. 16 pp. Illustrated. Describes the many possibilities of the VENUS for technical drawing.
Catalog, 3¾ x 8¾ in. 25 pp. Illustrated. Describes pencils, holders, erasers, etc.

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 101*

DUMBWAITERS

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 520. Describes K. & H. Co. electric dumbwaiters. 8 pp.

Sedgwick Machine Works, 151 West 15th St., New York.
Catalog and Service Sheets. Standard specifications, plans and prices for various types, etc. 4¼ x 8¼ in. 60 pp. Illustrated.

ELECTRICAL EQUIPMENT

Frank Adam Electric Company, St. Louis, Missouri.
Catalog No. 32—1924 Panelboards—Steel Cabinets. 48 pp. 7¾ x 10½ in. Illustrates and describes Safety Type Sectionally Constructed Panelboards, together with complete catalog listings.

Frink, Inc., I. P., 24th St. and 10th Ave., New York, N. Y.
Catalog 415. 8½ x 11 in. 46 pp. Photographs and scaled cross-sections. Specialized bank lighting, screen and partition reflectors, double and single desk reflectors and Polaralite Signs.

The Edwin F. Guth Co., 2615 Washington Ave., St. Louis, Mo.
Brascolite Catalog No. 10. 10½ x 8 in. 28 pp. Illustrated. Catalog listing Brascolite fixtures in wide variety of plain and decorative types. Contains information of value in planning a lighting installation.
Bank and Office Building Catalog. 10½ x 8 in. 16 pp. Illustrated. Catalog listing a selected line of fixture equipment for application to all outlets in bank or office buildings or similar buildings.
Architectural Bulletins, Series of 5. 10½ x 8 in. 28-64-44-28-44 pp. Illustrated. A series of five bulletins, each treating upon the application of lighting to one particular class of service. Hospitals; Banks and Office Buildings; Schools, Colleges and Y. M. C. A. Buildings; Church and Fraternal Buildings; Commercial Service.
Special Hospital Catalog. 10½ x 8 in. 9 pp. Illustrated. Illustrates a special selection of fixture equipment for hospital use including types suitable for all outlets.

Hart & Hegeman Mfg. Co., The, 342 Capitol Ave., Hartford, Conn.
The Line of Least Resistance. Catalog R. 10½ x 7⅞ in. 152 pp. Illustrated. Complete display of switches, sockets, accessories and wiring devices with brief description.
A new H & H Switch. Leaflet. 3½ x 6 in. 4 pp. Illustrated. Illustrates a new H & H composition base push switch of De Luxe quality.
Tumbler Switches. Booklet. 3½ x 6 in. 6 pp. Illustrated. Shows complete line of H & H Tumbler Switches.
H & H Elexits. Booklet. 8 x 10¾ in. Illustrated. Shows new complete line of Elexits—places for lights. May be used for Wall Receptacles or Electric Fixtures.

The Holtzer-Cabot Electric Co., Amory St., Boston 19, Mass.
Signaling Systems for Hospitals. Brochure. 8½ x 11 in. 42 pp. Illustrated. Contains complete data covering Nurse's Call, Doctor's Call, "In" and "Out" Fire Alarm, Watchman's Clock and Telephone Systems.
Signaling Systems for Schools. Brochure. 8½ x 11 in. 47 pp. Illustrated. Contains complete data covering Telephone Systems, Program Bells, Fire-Alarm Systems, Low Tension Power Plant and Laboratory Equipment.

Kohler Co., Kohler, Wis.
Kohler Automatic Power and Light' 110 Volt D. C. Booklet. 5 x 7 in. 32 pp. Illustrated. Describes a standard voltage automatic, electric power and light plant for isolated homes.
Principle and Proof. Booklet. 48 pp. Illustrated. Describes a standard voltage automatic electric power and light plant for isolated homes, for emergency auxiliary or permanent lighting in stores, theaters, churches and schools.

Pick & Company, Albert, 208 West Randolph St., Chicago, Ill.
School Cafeterias. Booklet. 9 x 6 in. Illustrated. The design and equipment of school cafeterias with photographs of installation and plans for standardized outfits.
Kitchen Equipment. Booklet. 9 x 6 in. Illustrated. Photographs and descriptions of Hotel, Club and Hospital kitchens with treatise on plans and equipment of efficient kitchens.
Electric Kitchen Equipment. Booklet. 8½ x 11½ in. Illustrated. Photographs and descriptions of PIX "Master-Made" ranges, ovens, etc., for Hotels and Restaurants.

Simplex Wire & Cable Co., 201 Devonshire St., Boston, Mass.
Simplex Manual Catalog and Reference Book. 6¼ x 4¼ in. 92 pp. Contains in addition to information regarding Simplex products, tables and data for the ready reference of architects, electrical engineers and contractors.
Specification No. 2053. For Simcore Wires and Cables. Various sizes of Conductor-Rubber Insulation.

Western Electric Co., 195 Broadway, New York, N. Y.
Western Electric Inter-Phones for Apartment Houses. Booklet. 5¼ x 6¾ in. 16 pp. Illustrated. Illustrates and describes use of Inter-Phones in Apartment Houses.
Installing and Maintaining Western Electric Inter-Phones. In addition to giving general information on layout of system, details are supplied on individual Inter-Phone Systems, listing battery and wiring requirements.

Westinghouse Electric & Mfg. Company, East Pittsburgh, Pa.
Safety Switches. Folder F-4434 B. 3½ x 6 in. 2 pp. The 100 per cent Safe Service Entrance Switch.
Meter Service Switches. Booklet F-4484. 3½ x 6 in. 16 pp.
Panel Boards. Catalog 22A. 8½ x 11 in. 16 pp. Illustrated.
What Fans Are For. Booklet F-4520. 3½ x 6 in. 16 pp. Illustrated in color.

ELEVATORS

A. B. See Elevator Company, Inc., 52 Vesey Street, New York, N. Y.
Current catalogue illustrated 8½ x 11 in. Engineering information and layout form for all types of electric elevators.

Kaestner & Hecht Co., Chicago, Ill.
Bulletin 500. Contains 32 pp. giving general information on passenger elevators for high buildings.
Bulletin 530. Interlocks for Passenger and Freight Elevators.
Bulletin. Signals for Passenger and Freight Elevators.

ELEVATORS—Continued

Otis Elevator Company, 260 Eleventh Ave., New York, N. Y.
Otis Push Button Controlled Elevators. Descriptive leaflets. 8½ x 11 in. Illustrated. Full details of machines, motors and controllers for these types.
Otis Geared and Gearless Traction Elevators of All Types. Descriptive leaflets. 8½ x 11 in. Illustrated. Full details of machines, motors and controllers for these types.
Escalators. Booklet. 8½ x 11 in. 22 pp. Illustrated. Describes use of escalators in subways, department stores, theaters and industrial buildings. Also includes elevators and dock elevators.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Elevators. Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes complete line of "Ideal" elevator door hardware and checking devices, also automatic safety devices.

Sedgwick Machine Works, 151 West 15th St., New York, N. Y.
Catalog and descriptive pamphlets. 4¼ x 8¼ in. 70 pp. Illustrated. Descriptive pamphlets on hand power freight elevators, sidewalk elevators, automobile elevators, etc.

FENCES

The Stewart Iron Works Company, Cincinnati, Ohio.
Book of Designs "C." 9 x 12 in. 80 pp. Illustrated. Book of designs illustrated from photographs of ornamental iron fence and entrance gates erected by us. Valuable to architects.

FIRE DOORS—**See Doors, Windows and Trim, Metal**

FIREPROOFING—**See also Construction, Fireproof**

The General Fireproofing Company, Youngstown, Ohio.
Fireproofing Handbook. 64 pp. 8½ x 11 in. Illustrated. Gives methods of construction, specifications, data on Herringbone metal lath, steel tile, Trussit solid partitions, steel lumber, self-centering formless concrete construction.

FLOOR HARDENERS (CHEMICAL)

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York, N. Y.
Lapidolith, the liquid chemical hardener. Complete sets of specifications for every building type in which concrete floors are used, with descriptions and results of tests.

FLOORING

Armstrong Cork & Insulation Co., 132 24th St., Pittsburgh, Pa.
Linotile Floors for Public and Semi-Public Buildings. 7½ x 10⅜ in. 36 pp.
Linotile Floors for Residences. 7½ x 10⅜ in. 32 pp.
Armstrong's Cork Tile. Revised Edition. Booklet. 24 pp. 5 x 7 in. Illustrated in color. Contains complete specifications.

Armstrong Cork Co. (Linoleum Division), Lancaster, Pa.
Armstrong's Linoleum Floors. Catalog. 8½ x 11 in. 36 pp. Color plates. A technical treatise on linoleum, including table of gauges and weights and specifications for installing linoleum floors.
Decorative Linoleum Floors. Portfolio of Color Plates. 11¼ x 15 in. 16 pp. Color plates.
Armstrong's Linoleum Pattern Book, 1925. Catalog. 3½ x 6 in. 200 pp. Color Plates. Reproductions in color of all patterns of linoleum and cork carpet in the Armstrong line.
Quality Sample Books. Two books. 3½ x 5¾ in. Showing all gauges and thicknesses in the Armstrong line of linoleum.
Detailed Directions for Laying and Caring for Linoleum. Handbook. 5 x 7 in. 48 pp. Instructions for linoleum layers and others interested in learning most satisfactory methods of laying and taking care of linoleum.
Business Floors. Booklet, 6 x 9 in. 48 pp. Illustrated in color. Explains use of linoleum for offices, stores, etc., with reproductions in color of suitable patterns, also specifications and instructions for laying.

Bonded Floors Company, Inc., 1421 Chestnut St., Philadelphia, Pa.
Gold-Seal Treadlite Tile. Booklet. 7⅞ x 10¾ in. 32 pp. Illustrated. An illustrated booklet showing Treadlite Tile installations and containing general information, specifications, etc., with reproductions of the product in color.
Gold-Seal Rubber Tile Folder. Folder 7⅛ x 10¾ in. 8 pp. Illustrated. A folder describing the usages and composition of Rubber Tile. Profusely illustrated with pictures of installations and reproductions of the product in color.
Hospital Floors. Description and advantages of using Gold-Seal Battleship Linoleum. Gold-Seal Treading Tile and Gold-Seal Rubber Tile in hospital construction insuring durable, noiseless, sanitary and attractive floors. Illustrated in color. 8 x 10¾ in.
Distinctive Floors. A publication describing Gold-Seal Treadlite Tile, its composition, manufacture and method of installation. Illustrated in full color, 8 x 10¾ in. 8 pp.

Carter Bloxonend Flooring Co., Long Bldg., Kansas City, Mo.
Bloxonend Flooring. Booklet. 3¼ x 6¼ in. 20 pp. Illustrated. Describes uses and adaptability of Bloxonend Flooring to concrete, wood or steel construction, and advantages over loose wood blocks.
Specification Sheet. 4 pp. 8½ x 11 in. Illustrated. Standard Specifications in convenient form for Architects and Engineers.
Lateral Nailing Specification. Folder, 8½ x 3¾ in. 4 pp. Illustrated. Shows how this method of nailing eliminates embedded sleepers, wood sub-floor or nailing strips.
What's in a Name? Folder. 8½ x 11 in. Illustrated. Enumerates advantages of a heavy service flooring that lays smooth and stays smooth.

Duraflex Company, Inc., 11 Pleasant Street, Baltimore, Md.
Why They Used It in One of Boston's Finest Buildings.
Typical of Character of One of the 13 Original States.
Illustrated 4-page brochures, 5¼ x 8¼ in. giving data on "Duraflex" floors.
Permanent, Easy Tread Flooring. Folder 4 pp. 8½ x 11 in. on floor covering material.
Specifications for Sub-Floors for "Duraflex." Folder. 11 pp. 8½ x 11 in. on base for laying "Duraflex."
Test of Floorings. Folder. 2 pp. Report of Flooring Committee of American Hospital Association.

Galassi Company, 153 East 38th St., New York, N. Y.
Suggesting a Standard Specification for Terrazzo Work. Booklet. Specifications for the use of terrazzo.

Muller Co., Franklyn R., Waukegan, Ill.
Asbestone Composition Flooring. Circular. 8½ x 11 in. Descriptions and Specifications.

ANACONDA ARCHITECTURAL BRONZE

EXTERIOR View, Bronze Window, Federal Reserve Bank, New York.

Architects: York and Sawyer, New York.

Fabricator: William H. Jackson Company, New York.

Anaconda Extruded Bronze supplied by The American Brass Company.

THE AMERICAN BRASS COMPANY

GENERAL OFFICES: WATERBURY, CONNECTICUT

New York, Chicago, Boston
Philadelphia, Providence, Pittsburgh
Cleveland, Detroit, Cincinnati
St. Louis, New Orleans, San Francisco

ANACONDA
from mine to consumer

Mills and Factories:
Ansonia, Conn., Torrington, Conn.
Waterbury, Conn., Buffalo, N. Y.
Hastings-on-Hudson, N.Y., Kenosha, Wis.

In Canada: ANACONDA AMERICAN BRASS LIMITED, NEW TORONTO, ONTARIO

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 102*

FLOORING—Continued

Norton Company, Worcester, Mass.
Filing Folder. 8½ x 11¾ in. 27 pp. Illustrated with drawings. Specification data for architects.

Rodd Company, The, Century Bldg., Pittsburgh, Pa.
Redwood Block Floor. Booklet. 4 x 9 in. Illustrated. Contains technical information on Rodd Floors of California Redwood Blocks. Also specifications.

U. S. Gypsum Co., Chicago.
Pyrobar Floor Tile. Folder. 8½ x 11 in. Illustrated. Data on building floors of hollow tile, and tables on floor loading.

FURNACES—See Heating Equipment

FURNITURE

Allen, Louis L., 521 Madison Ave., New York, N. Y.
Booklet. 5 x 7½ in. Illustrated. Issued quarterly, listing many antique pieces of furniture, old oak and pine paneling and garden figures; fountains, bird baths, sundials, etc.

American Seating Co., 14 E. Jackson Blvd., Chicago, Ill.
Ars Ecclesiastica Booklet. 8½ x 11 in. 48 pp. Illustrations of church fitments in carved wood.
Theater Chairs. Booklet. 6 x 9 in. 48 pp. Illustrations of theater chairs.

Fain Manufacturing Company, Norfolk, Virginia.
The Fain Fold Away Dining Room. Booklet. 4 pp. 8½ x 11 in. Illustrated. Information to architects and builders on new folding devices with architect's specifications and views of construction. Concise description of merits, use and price.

Kensington Mfg. Company, 41 West 45th St., New York, N. Y.
Photographs and full description of hand-made furniture in all the period styles, furnished in response to a specific inquiry.
Illustrated booklet indicative of the scope, character and decorative quality of Kensington furniture mailed on request.

White Door Bed Company, The, 130 North Wells Street, Chicago, Ill.
Booklet. 8½ x 11 in. 20 pp. Illustrated. Describes and illustrates the use of "White" Door Bed and other space-saving devices.

GARDEN ACCESSORIES

Davey Tree Expert Company, The, 907 Elm St., Kent, Ohio.
When Your Trees Need The Tree Surgeon. Booklet. 16 pp. 8 x 9¼ in. Illustrated. Lists and explains a number of serious tree troubles of common occurrence; contrasts the scientific methods used by properly trained and conscientious men to remedy these troubles with the work of unscrupulous or untrained men.

GLASS CONSTRUCTION

Mississippi Wire Glass, 220 Fifth Avenue, New York.
Mississippi Wire Glass. Catalog. 3⅞ x 8½ in. 32 pp. Illustrated. Covers the complete line.

Pittsburgh Plate Glass Co., Pittsburgh.
Glass, Paints, Varnishes and Brushes. Book. 9 x 11 in. 190 pp. An extremely fine treatise on the history, manufacture, and use of these commodities.

Plate Glass Mfrs. of America. First National Bank Bldg., Pittsburgh, Pa.
Plate Glass. Booklet. 5¾ x 9¼ in. 12 pp. Describes manufacture and use of plate glass, with sizes.

GRANITE—See Stone, Building

HARDWARE

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

McCabe Hanger Manufacturing Company, 425 West 25th St., New York, N. Y.
Special Folding and Accordion Door Hangers. Booklet. 6 x 9 in. 8 pp. Illustrated. Booklet with complete description of various types of folding and accordion door hangers. Full size details upon request.

McKinney Mfg. Co., Pittsburgh, Pa.
McKinney Complete Garage Hardware Sets. Catalog. 6¾ x 10 in. 20 pp. Illustrated. Describes full line of complete garage hardware sets for all kinds of entrances, with views of typical entrances and sketches.
McKinney Hinges and Butts. General Catalog. 6¾ x 10 in. Illustrates and describes complete line of McKinney wrought builders' hardware products, including hinges, butts, door hangers and track, latches, garage hardware and specialties.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Distinctive Garage Door Hardware. Booklet. 8½ x 11 in. 65 pp. Illustrated. Complete information accompanied by data and illustrations on different kinds of garage door hardware.

Sargent & Company, New Haven, Conn.
Sargent Locks and Hardware. Architects' Edition. 9 x 12 in. 762 pp. Illustrated. The latest complete catalog of Locks and Hardware.
Details to Which Standard Hardware Can Be Applied. Booklet. 6 pp. 9 x 12 in. Illustrated. Treats with diagrams, portions of doors and windows to which hardware can be applied.

Vonnegut Hardware Co., Indianapolis, Ind.
Von Duprin Self-Releasing Fire Exit Devices. Catalog. 12F. 8 x 11 in. 41 pp. Illustrated.
Saving Lives. Booklet. 3¼ x 6 in. 16 pp. Illustrated. A brief outline why Self-Releasing Fire Exit Devices should be used.

HEATING EQUIPMENT

Bryant Heater & Mfg. Co., The, 962 East 72nd St., Cleveland, O.
Hand Book on Water Heating by Gas. 8½ x 11 in. 16 pp. Illustrated. Bryant Gas Boilers. Bulletin 309, for AIA File No. 29 D2. Contains valuable information on hot water, steam and vapor heating; data to determine quickly the size of heating plant for any building; also dimensions, weights, fittings furnished and other data of interest. Other descriptive literature available. Comprehensive handbook in preparation.

HEATING EQUIPMENT—Continued

Hand Book on House Heating by Gas. 8½ x 11 in. 8 pp. Illustrated. Bryant Automatic Hot Water Storage Systems. Bulletin 308, for AIA File No. 30 C1. Contains complete information on water heating systems, weights, dimensions, etc. Other descriptive material available. Comprehensive handbook in preparation.

James B. Clow & Sons, 534 S. Franklin St., Chicago, Ill.
Gasteam. Catalog. 6 x 9 in. 16 pp. Illustrated. New radiator using gas for fuel.

Cox Stove Company, Abram, American and Dauphin Sts., Philadelphia, Pa.
Make Wintry Days Happy Days. Folder. 3½ x 6¼ in. 8 pp. Illustrated. Two folders. One describes in detail Novelty Marvel Warm Air Furnaces. The other shows the Pipeless Novelty Marvel.
Novelty Boilers 76A. Booklet. 6½ x 3¾ in. 32 pp. Illustrated. Descriptive of entire line of boilers, including Novelty Round Boilers, Side-Feed Sectional Boilers 18-25-30-40 Series, and Carburetor Boilers, 30 and 40 Series; Novelty Water Heaters.

Excelso Specialty Works, 119 Clinton St., Buffalo, N. Y.
Excelso Water Heater. Booklet. 12 pp. 3 x 6 in. Illustrated. Describing the new Excelso method of generating domestic hot water in connection with heating boilers. (Firepot Coil eliminated.)

The Fulton Company, Knoxville, Tenn.
Sylphon Temperature Regulators. Bulletin T-103. 8½ x 11 in. 16 pp. Complete data on Sylphon temperature regulators for air and liquids. Catalog 100, complete line Sylphon Heating Specialties.
Damper Regulators. Air and Vent Valves. Catalog No. 100. 3¾ x 6¼ in. Sylphon Damper Regulators for steam, hot water and vapor systems. Sylphon Air and Vent Valves.

Illinois Engineering Co., Racine Ave., at 21st St., Chicago, Ill.
Vapor Heat Bulletin 21. 8½ x 11 in. 32 pp. Illustrated. Contains new and original data on Vapor Heating. Rules for computing radiation, pipe sizes, radiator tappings. Steam table showing temperature of steam and vapor at various pressures, also description of Illinois Vapor Specialties.

Johnson Service Company, 149 Michigan St., Milwaukee, Wis.
Regulation of Temperature and Humidity. Booklet. 11¼ x 8½ in. 64 pp. Illustrated. Describes Johnson system of pneumatic, automatic regulation of temperature and humidity, and illustrates thermostats, valves, air compressors, dampers and other parts.
Johnson Electric Thermostats, Valves and Controllers. Booklet. 6⅛ x 3½ in. 24 pp. Illustrated. Excellent plates showing electric thermostats and controllers.

Kelsey Heating Company, James St., Syracuse, N. Y.
Booklet No. 5. 4 x 9 in. 32 pp. Illustrated. A dealers' booklet showing the Kelsey Warm Air Generator Method of warming and distributing air. Gives dimensions, heating capacities, weights, kind of coal recommended and shows the mechanical and gravity systems of heating homes, churches and schools.
Monroe Pipeless Booklet. 4½ x 8 in. 20 pp. Illustrated.
Monroe Tubular Heater. Booklet. 4½ x 8 in. 20 pp. Illustrated. General Booklet giving capacities, dimensions, weights, etc.
Syracuse Pipeless Booklet. 4½ x 8 in. 12 pp. Illustrated. General Booklet giving sizes and capacities.

Kewanee Boiler Co., Kewanee, Ill.
Kewanee on the Job. Catalog. 8½ x 11 in. 80 pp. Illustrated. Showing installations of Kewanee boilers, water heaters, radiators, etc.
Catalogue No. 78. 6 x 9 in. Illustrated. Describes Kewanee Firebox Boilers with specifications and setting plans.
Catalogue No. 79. 6 x 9 in. Illustrated. Describes Kewanee power boilers and smokeless tubular boilers with specifications.

Ruud Manufacturing Company, Pittsburgh, Pa.
Architects' Specification Folder. 9 x 11¾ in. Complete specifications covering different types of gas water heaters. Conforms to A. I. A. filing system.

Utica Heater Company, Utica, N. Y.
Imperial Round and Square Boilers and Supplies. Catalog. 3½ x 6½ in. Gives complete data on small heaters.
Special Folders. 8½ x 11 in. "Warmth and Comfort," describing the scientifically correct NEW IDEA pipeless furnaces. "SUPERIOR Warm Air Pipe Furnaces," a standard line of heating equipment for over forty years. "SUPER-SMOKELESS Pipe and Pipeless Furnaces." a new and remarkably efficient warm air heater, burning cheap soft coal without smoke—utilizing the principle of the Bunsen Burner.
Utica Imperial SUPER-SMOKELESS Boiler. Catalog. 8½ x 11 in. Consists of the following seven bulletins, either loose or bound together: (1) School Heating Bulletin. (2) Public Building Bulletin. (3) Theater Heating Bulletin. (4) Churches and Religious Institutions. (5) Residences, Apartments and Hotels. (6) Offices, Industrial Buildings and Garages. (7) Technical Bulletin describing patented Bunsen Burner design and construction of the SUPER-SMOKELESS BOILER, which burns the cheapest grades of soft coal smokelessly and operates equally well with hard coal, coke or fuel oil.

HEAT REGULATORS—See Heating Equipment

HEATING AND VENTILATING

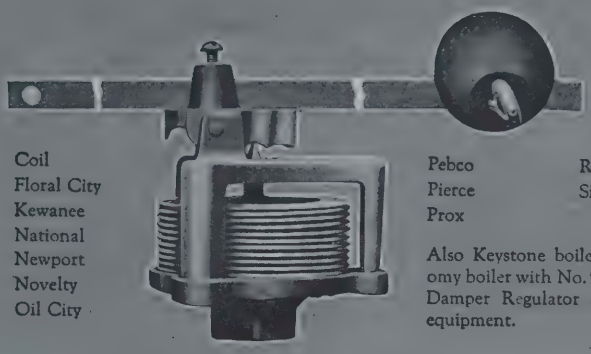
Hoffman Specialty Company, Inc., 512 Fifth Ave., New York, N. Y.
Controlled Heat Booklet. 5½ x 8½ in. 28 pp.
The principles of vapor vacuum heat described in simple language for the consumer or layman.
Locking the Door Against the Heat Thief. Booklet. 5½ x 8½ in. 16 pp.
Describes No. 2 Hoffman Vacuum Valves and the principle of "Vacuum-izing" a single pipe steam heating system in consumer language.

Standard Equipment On All These Steam Boilers

Floral City

Abco
Abendroth
Ames
Bernhard
Birchfield
Butler
Coatesville
Coil
Floral City
Kewanee
National
Newport
Novelty
Oil City
Pebco
Pierce
Prox
Richardson
Simplex

Also Keystone boiler and Economy boiler with No. 924 Sylphon Damper Regulator as standard equipment.



No. 22 Sylphon Damper Regulator for low pressure steam boilers

Birchfield

Richardson

Every Coal Fired Boiler Burns Coal and "Air"

—the coal costs money—the air is FREE

A BOILER, that in the language of the householder, is "a hog for coal," is bad business for both the householder and the boiler manufacturer. The 21 leading manufacturers who have standardized on equipping their boilers with Sylphon Damper Regulators *know* that these regulators will feed just the right amount of air to economically burn a minimum of coal, obviate all overheating or underheating, and prevent for all time the necessity of running up and down stairs to adjust drafts.

Oil City

The secret of the Sylphon accuracy is the Sylphon Bellows

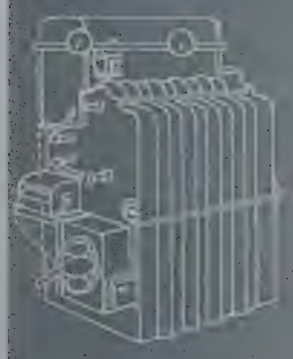
This bellows, drawn from a flat sheet of metal *without soldered seam* is at once the most flexible and powerful expansion member known to engineers. There is only *one* Sylphon bellows. It is made by The Fulton Company of Knoxville, Tennessee, and is used exclusively in Sylphon Damper Regulators.

Other famous Sylphon Damper Regulators are

No. 45-A for hot-water boilers; No. 925 for vapor heating systems; No. 924 for low pressure (down to 6 ozs.) steam boilers.

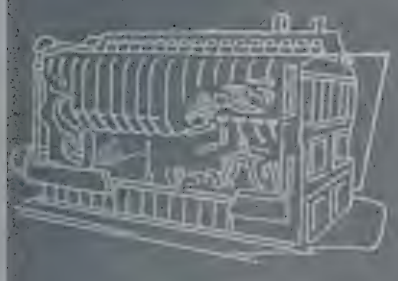
All Sylphon Damper Regulators are made in standard iron pipe sizes and may be used on any make of boiler. Jobbers carry stocks.

Ask for Bulletin DR

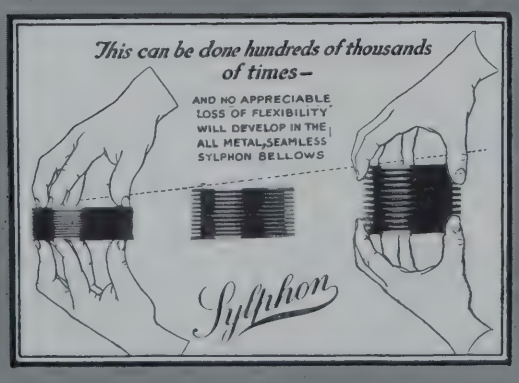


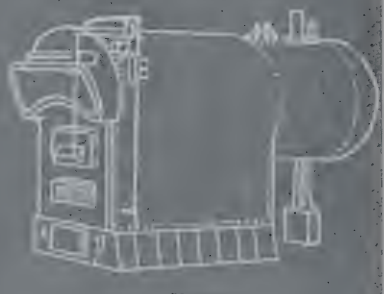
Newport

National



Prox





Kewanee

THE FULTON COMPANY, KNOXVILLE, TENN.

New York Chicago Detroit Boston Philadelphia ***Representatives in all principal cities in U. S.***

European representatives: **Crosby Valve & Engineering Co., Ltd., 41-42 Foley Street, London, W. 1., England**

Canadian representatives: **Darling Bros., Ltd., 120 Prince Street, Montreal, Canada**

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 104*

HEATING AND VENTILATING—Continued

Thatcher Furnace Co., 39-41 St. Francis St., Newark, N. J.
Thatcher Heating and A Few Installations. 25 pp. 6 x 9 in. Illustrated. Contains photos. of various types of buildings in which Thatcher Heaters are installed together with cuts and description of Thatcher Heaters.
History of Heat. 15 pp. 8 x 5 in. Illustrated. Tracing the evolution of heat from its earliest stages.

United States Radiator Corporation, Detroit, Mich.
The Complete Line Catalog. 6⅜ x 3¼ in. 270 pp. Illustrated. Giving complete information and engineering data on Capital and Winchester Boilers.

HOISTS—See Ash Hoists

HOLLOW TILE—See Tile, Hollow

HOSPITAL EQUIPMENT

Betz Company, Frank S., Hammond, Ind. 30 E. Randolph St., Chicago, Ill.
Hospital Book. 7½ x 10½ in. 212 pp. Illustrated profusely. Lists and describes with prices and illustrations a complete line of steel hospital furniture.

The International Nickel Company, 67 Wall St., New York, N. Y.
Hospital Applications of Monel Metal. Booklet. 8½ x 11½ in. 16 pp. Illustrated. Gives types of equipment in which Monel Metal is used, reasons for its adoption, with sources of such equipment.

The Kny-Scheerer Corporation of America, 119 Seventh Ave., New York.
Hospital Equipment, 16th Edition. 7¼ x 10½ in. 232 pp. Illustrated. Complete description of Hospital and Surgical Furniture, Hospital Appliances including Operating Tables, Cabinets, Sterilizers for Water, Dressing and Instruments, also Hydrotherapeutic Apparatus.
Surgical Sundries. Second Edition. Booklet. 7⅜ x 10½ in. 48 pp. Illustrated. A complete line of glassware, enamelware, rubber goods, restraint apparatus, instrument sterilizers, sputum cups, wheel chairs and sick room comforts.
Electro-Medical. 25th Edition. Booklet. 7¼ x 10½ in. 160 pp. Illustrated. A complete line of Albee Bone Sets, Apparatus for AC and DC, Cystocopes, Heat Magnets, Vibrators, Compressors, Electric Light Baths, High Frequency Apparatus and X-Ray Apparatus and Accessories.

INCINERATORS

The Kerner Incinerator Company, 1029 Chestnut St., Milwaukee, Wis.
The Kernerator. Booklet. 5½ x 9¼ in. 40 pp. Illustrated. Describes principle and design of the Kernerator, guarantee and service, also gives illustrations of buildings where it has been installed, and testimonials.
Sanitary Elimination of Household Waste. Booklet. 4 x 9 in. 16 pp. Illustrated. Shows process, installations and advantages of the Kernerator.
Sanitary Disposal of Waste in Hospitals. Booklet. 4 x 9 in. 12 pp. Illustrated. Shows how this necessary part of hospital service can be taken care of by the Kernerator.

INSULATION

Armstrong Cork & Insulation Co., Pittsburgh, Pa.
Corkboard Insulation. Brochure. 6¼ x 9¼ in. Illustrated. Fully discusses properties of corkboard and its uses in insulation of cold storage rooms, refrigerators, residences, apartment houses.

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
Specifications and Working Details. Booklet. 7¾ x 10½ in. Illustrated. Contains plainly written instructions for the use of stucco, stucco base, plaster base and insulation base.

Philip Carey Co., The, Cincinnati, Ohio.
Carey Asbestos and Magnesia Products. Catalog. 6 x 9 in. 72 pp. Illustrated.

Johns-Manville, Inc., Madison Ave., and 41st St., New York, N. Y.
Johns-Manville Service to Power Users. Catalog. 8½ x 11 in. 150 pp. Illustrated. Contains valuable data on all forms of insulation, packages, steam traps, high temperature cements, brake locks and linings, also general technical data.

United States Mineral Wool Co., 280 Madison Ave., New York.
The Uses of Mineral Wool in Architecture. Booklet. 5¼ x 6⅝ in. 24 pp. Illustrated. Describes properties of mineral wool as insulation against heat, frost, sound. Specifications and section drawing for use as a fireproofing. Rules for estimate and cost.

KITCHEN EQUIPMENT

Betz Company, Frank S., Hammond, Ind. 30 E. Randolph St., Chicago, Ill.
Kitchunit. Booklet. 7 x 10½ in. 4 pp. Illustrated. This illustrates and describes, including specifications, the Betzco All-Steel Kitchunits. A space-saving equipment that lowers building costs.

Colt's Patent Fire Arms Mfg. Company, Hartford, Conn.
AUTOSAN Dish and Silver Cleaning Machines. Booklets. 6 x 9 in. Describing rotary table type and conveyor type machines.

Wm. M. Crane Company, 16-20 W. 32nd St., New York, N. Y.
VULCAN Gas Ranges and Appliances. Booklet. 5 x 8 in. 50 pp. Illustrated. Describes complete line, including VULCAN SMOOTH TOP Compact Cabinet Gas Ranges for kitchens in the home.
VULCAN Gas Equipment for Hotels, Hospitals, Restaurants, etc. Booklet. 5 x 8 in. 45 pp. Illustrated. Equipment for heavy-duty cooking requirements, with information of value to architects in planning kitchens.

The International Nickel Company, 67 Wall St., New York, N. Y.
Hotels, Restaurants and Cafeteria Applications of Monel Metal. Booklet. 8½ x 11 in. 32 pp. Illustrated. Gives types of equipment in which Monel Metal is used, with service data and sources of equipment.

KITCHEN EQUIPMENT—Continued

Pick & Company, Albert, 208 W. Randolph St., Chicago, Ill.
School Cafeteria. Portfolio. 17 x 11 in. 44 pp. Illustrated. An exhaustive study of the problems of school feeding, with copious illustrations and blue prints. Very valuable to the architect.
School Cafeterias. Booklet. 9 x 6 in. Illustrated. The design and equipment of school cafeterias with photographs of installation and plans for standardized outfits.
Kitchen Equipment. Booklet. 9 x 6 in. Illustrated. Photographs and descriptions of Hotel, Club and Hospital kitchens with treatise on plans and equipment of efficient kitchens.
Electric Kitchen Equipment. Booklet. 8½ x 11½ in. Illustrated. Photographs and descriptions of PIX "Master-Made" ranges, ovens, etc., for Hotels and Restaurants.
Hotel, Apartment Building, Club and Institution Installations. Portfolio. 17 x 11 in. 100 pp. Shows, mostly by plates, how the Albert Pick Company equips hotels completely from top to bottom.
Equipment for Cafeterias, Lunch Rooms, Restaurants, and Dining Rooms. Portfolio. 17 x 11 in. 86 pp. Illustrated. The last word in Cafeteria equipment to meet all requirements.

Thatcher Furnace Co., 39-41 St. Francis St., Newark, N. J.
Range with Personality. 15 pp. 8 x 5 in. Illustrated. Explains the famous Thatcher "Twin-Fire" combination coal and gas range.
Thatcher is the Heater for that Building. 8 pp. 8 x 9 in. Illustrated. Contains cuts, dimensions, and descriptions of Thatcher Heaters for architects' use.

LABORATORY EQUIPMENT

Kewaunee Manufacturing Company, 141 Lincoln St., Kewaunee, Wis.
Kewaunee Book of Laboratory Furniture. Catalog. 7 x 10 in. 408 pp. Illustrated. Science and Vocational Laboratory Furniture for schools, colleges, technical institutes, hospitals, etc., including floor plans, illustrations of buildings and equipped laboratories, illustrations of equipment engineering data for mechanical ventilation and illustrations of special plumbing fixtures for laboratory use.

LANTERNS

Todhunter, Arthur, 414 Madison Ave, New York.
Hand Wrought Lanterns. Booklet. 5¼ x 6¼ in. 20 pp. Illustrated in Black and White. With price list. Lanterns appropriate for exterior and interior use, designed from old models and meeting the requirements of modern lighting.

LATH, METAL AND REINFORCING

The General Fireproofing Company, Youngstown, Ohio.
Herringbone Metal Lath Handbook. 8½ x 11 in. 32 pp. Illustrated. Standard specifications for Cement Stucco on Herringbone Rigid Metal Lath and interior plastering.

Milwaukee Corrugating Co., Milwaukee, Wis.
The Milcor Manual. Booklet 8½ x 11 in. 64 pp. Illustrated. Covers Milcor methods and materials, metal lath, corner beads, steel domes, channels, etc.

National Steel Fabric Company, Pittsburgh, Pa.
Folder. 8½ x 11 in. 6 pp. Illustrated. Describes National Stucco-Plaster Reinforcement, a base for exterior stucco and interior plastering, composition flooring, etc., with photographs and drawings.

Northwestern Expanded Metal Co., 934 Old Colony Building, Chicago, Ill.
Fireproof Construction Catalog. 6 x 9 in. 72 pp. Illustrated. Hand book of practical suggestions for architects and contractors, Describing Nemco Expanded Metal Lath.

LAUNDRY CHUTES

The Pfaudler Company, 217 Cutler Building, Rochester, N. Y.
Pfaudler Glass-Lined Steel Laundry Chutes. Booklet. 5⅛ x 7⅜ in. 16 pp. Illustrated. A beautifully printed brochure describing in detail with architects' specifications THE PFAUDLER GLASS LINED STEEL LAUNDRY CHUTES. Contains views of installations and list of representative examples.

MAIL CHUTES

Cutler Mail Chute Company, Rochester, N. Y.
Cutler Mail Chute Model F. Booklet. 4 x 9¼ in. 8 pp. Illustrated.

MANTELS

Arthur Todhunter, 414 Madison Ave., New York, N. Y.
Mantels and Fireplace Equipment. Booklet. 8½ x 11 in. Illustrated. Separate sheet plates showing mantels installed and furnished, also andirons and grates grouped with suitable pieces, also lanterns, weather-vanes and hand-wrought hardware. All sizes and descriptions given on each plate.

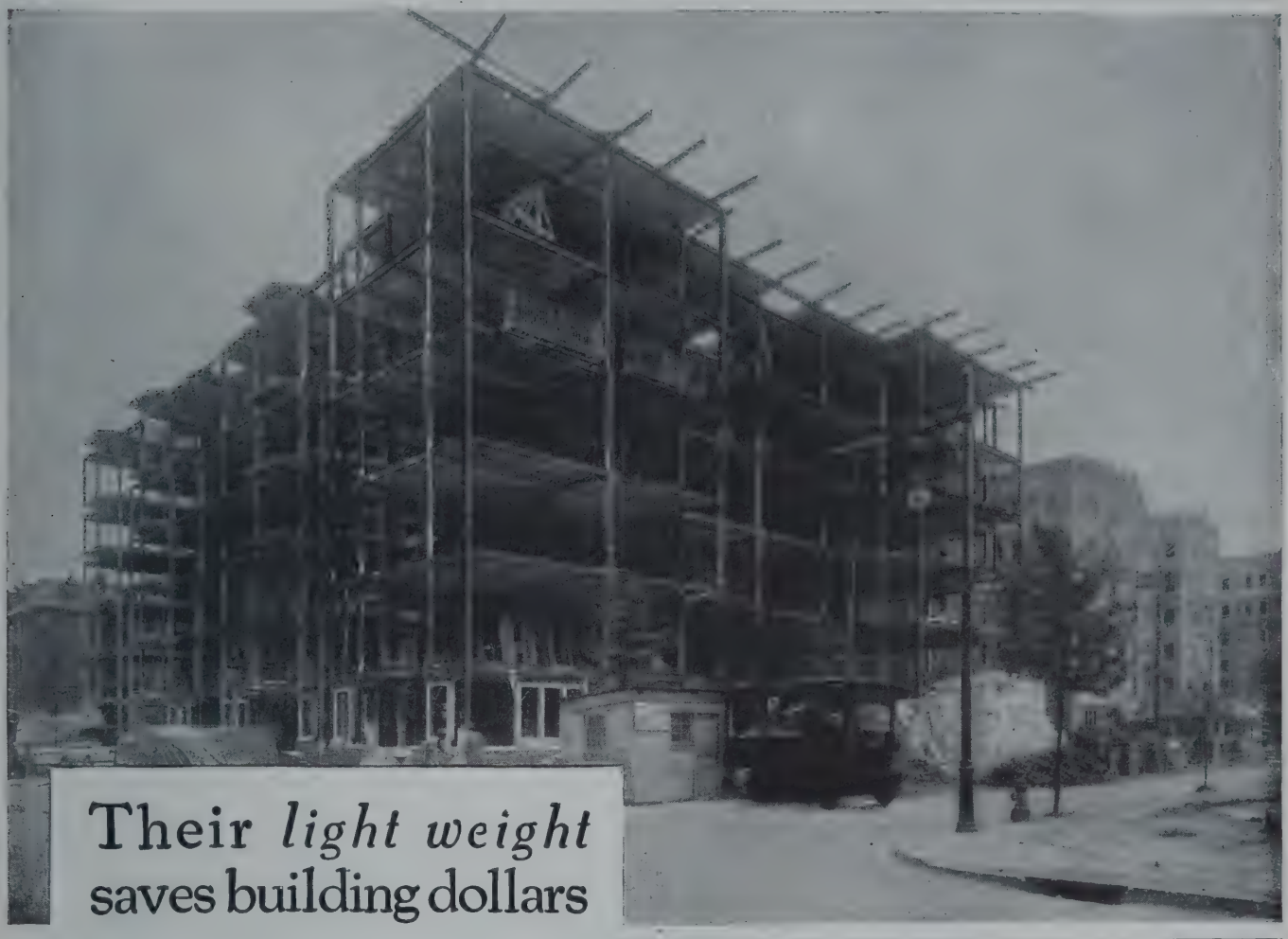
MARBLE

The Georgia Marble Company, Tate, Ga. New York Office, 1328 Broadway.
Why Georgia Marble is Better. Booklet. 3⅜ x 6 in. Gives analysis, physical qualities, comparison of absorption with granite, opinions of authorities, etc.
Convincing Proof. Booklet. 3⅜ x 6 in. 8 pp. Classified list of buildings and memorials in which Georgia Marble has been used, with names of Architects and Sculptors.

METAL LATH—See Lath, Metal and Reinforcing

METALS

American Sheet & Tin Plate Co., Frick Building, Pittsburgh, Pa.
Reference Book: Pocket Ed. 2½ x 4½ in. 168 pp. Illustrated. Covers the complete line of Sheet and Tin Mill Products.
Apollo and Apollo-Keystone Galvanized Sheets. Catalog. 8½ x 11 in. 20 pp. Illustrated.
Research on the Corrosion Resistance of Copper Steel. Booklet. 8½ x 11 in. 24 pp. Illustrated. Technical information on results of atmospheric corrosion tests of various sheets under actual weather conditions.



Their *light weight* saves building dollars

Architects and owners planning new structures or additional floors on present buildings will want to look into the many economies of Pyrofill monolithic floors.

This poured-in-place construction consists of properly spaced and anchored steel cables to which the live loads are carried by gypsum slabs. Among its chief advantages are: light weight, quick set, high insulating value.

Weighing only 50 lbs. per cubic foot (one-third the weight of concrete), Pyrofill floors allow lighter supporting steel, thereby effecting a real saving in total building costs. Millions of feet have been installed throughout the country.

There is a type of Pyrofill (poured slabs) or Pyrobar (precast voids) for every floor design. We contract to erect them. Mail coupon for bulletin describing Pyrofill construction.

UNITED STATES GYPSUM COMPANY
General Offices:
Dept. R, 205 West Monroe Street, Chicago, Illinois

PYROFILL
MONOLITHIC FLOORS

U.S.G.

Garden Apartments, Philadelphia.
Owner: Clarence R. Siegel. 203,600 sq. ft. Pyrofill floor slabs used

United States Gypsum Company
Dept. R, 205 W. Monroe Street, Chicago, Ill.

Please send me your special data bulletin on Pyrofill floors.

Name .....

Address .....

.....

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 106*

METALS—Continued

Chase Metal Works, Waterbury, Conn.
How to Order Brass. Booklet. 8⅛ x 5½ in. Illustrated. Tells just how to order brass—about alloys, tempers, tolerances most suitable for various uses. Warns against the usual mistakes and troubles in ordering. Contains complete tables of alloys, tempers, tolerances, uses, etc.
Chase Diamond Booklet. 11⅞ x 9 in. 8-16 pp. Illustrated. Periodical house organ issued once a month or so. Contains articles, pictures, news items of interest to customers, employes and brass industry in general. Ask to be put on the mailing list.

The International Nickel Company, 67 Wall St., New York, N. Y.
The Choice of a Metal. Booklet. 6¼ x 3¼ in. 16 pp. Illustrated. Monel Metal—its qualities, use and commercial forms, briefly described.

METAL TRIM—See Doors and Trim, Metal

MILL WORK—See also Wood

Curtis Companies Service Bureau, Clinton, Iowa.
Architectural Interior and Exterior Woodwork. Standardized. Book. 9 x 11½ in. 240 pp. Illustrated .This is an Architects' Edition of the complete catalog of Curtis Woodwork, as designed by Trowbridge & Ackerman. Contains many color plates.
Better Built Homes, Vols. XV-XVIII incl. Booklet. 9 x 12 in. 40 pp. Illustrated. Designs for houses of five to eight rooms, respectively, in several authentic types, by Trowbridge & Ackerman, architects for the Curtis Companies.
Curtis Details. Booklet. 19½ x 23½ in. 20 pp. Illustrated. Complete details of all items of Curtis woodwork, for the use of architects.

Roddis Lumber & Veneer Company, Marshfield, Wis.
Roddis Doorman. Booklet. 10¼ x 7¼ in. 12 pp. Illustrated. Describes and illustrates the use of Roddis Doors for residences, clubs, hotels, etc.

Hartmann-Sanders Company, 2155 Elston Ave., Chicago, Ill.
Column Catalog. 7½ x 10 in. 48 pp. Illustrated. Contains prices on columns 6 to 36 in. diameter, various designs and illustrations of columns and installations.
The Pergola Catalog. 7½ x 10 in. 64 pp. Illustrated. Contains illustrations of pergola lattices, garden furniture in wood and cement, garden accessories.

MORTAR COLORS

Clinton Metallic Paint Co., Clinton, N. Y.
Clinton Mortar Colors. Folder. 8½ x 11 in. 4 pp. Illustrated in color, gives full information concerning Clinton Mortar Colors with specific instructions for using them.
Color Card. 6½ x 3¼ in. Illustrates in color the ten shades in which Clinton Mortar Colors are manufactured.

OFFICE SUPPLIES

Chas. M. Higgins & Co., 271 Ninth St., Brooklyn, N. Y.
Descriptive Catalog. 3½ x 5½ in. 27 pp. Illustrated. Contains description and prices of Higgins Inks and Adhesives, color card illustrating various colors of the drawing inks supplied separate, size 3½ x 6¼.

PAINTS, STAINS, VARNISHES AND WOOD FINISHES

Cabot, Inc., Samuel, Boston, Mass.
Cabot's Creosote Stains. Booklet. 4 x 8½ in. 16 pp. Illustrated.

Eagle-Picher Lead Company, The, 208 S. La Salle St., Chicago, Ill.
Specifications for Painting Structural Steel and Iron. Booklet. 9½ x 11½ in. 7 pp. Not Illustrated. A set of specifications which embody the latest development in this field as revealed by the research department of The Eagle-Picher Lead Company in the light of their eighty-one years' experience, enclosed in folder 13 x 2 in., ready for filing.
Fighting Rust with Sublimed Blue Lead. Book. 80 pp. Illustrated. 5½ x 8½ in. An excellent addition to one's technical library, well bound in a stiff cover. An assemblage of scientific facts concerning the theory of corrosion of iron and steel and the prevention of rust with Sublimed Blue Lead.
Chemical Analysis of Lead and Its Compounds. Book. 5½ x 8½ in. 160 pp. Illustrated. A treatise on the latest methods of analysis adopted by the leading laboratories which must examine lead and its compounds from an analytical standpoint.
Lead Tree Chart. 9 x 11½ in. 1 p. Framed Chart. Not illustrated. A chart reflecting all the uses of lead, from crude ore to the finished products.
Zinc Tree Chart. 9 x 11½ in. 1 p. Framed Chart. Not illustrated. A chart reflecting all the uses of zinc—from the ore to the finished product.
Rust-proofing Pamphlet. 3 x 5 in. 16 pp. Illustrated. Of interest to anyone connected in any way with steel construction.

The Glidden Company, Cleveland, Ohio.
More Daylight. 8 x 10½ in. 20 pp. Portraying by illustrations and text the need and methods of modern mill painting.

The Hockaday Company, 1823 Carroll Ave., Chicago, Ill.
Paint Mileage. Book. 8 x 10½ in. 56 pp. Illustrated. A reference book on interior painting. Describes use of paint over all sorts of surfaces, with illustrations of buildings where Hockaday has been specified. Hockaday service explained.
Solving Your Paint Problems. Booklet. 8½ x 11 in. 44 pp. Illustrated. Describes use of Hockaday Paint in Industrial Buildings, particularly in textile mills. Details of Hockaday service and specifications.

Martin Varnish Co., 2500 Quarry St., Chicago, Ill.
Architectural Specifications. Booklet. 8½ x 11 in. 20 pp. Illustrated. Complete guide for Architects in specifying Martin Varnish products.
Your Floors. Booklet. 5 x 7 in. 20 pp. Illustrated. Explains fully how to finish all kinds of floors and woodwork with Martin's Pure Varnish.

National Lead Company, 111 Broadway, New York, N. Y.
Handy Book on Painting. Book. 5½ x 3¼ in. 100 pp. Gives directions and formulæ for painting various surfaces of wood. plaster, metals, etc., both interior and exterior.
Red Lead in Paste Form. Booklet. 6¼ x 3½ in. 16 pp. Illustrated. Directions and formulæ for painting metals.

PAINTS, STAINS, VARNISHES & WOOD FINISHES—Continued

Came Lead. Booklet. 8¼ x 6 in. 12 pp. Illustrated. Describes various styles of lead cames.
Cinch Anchoring Specialties. Booklet. 6 x 3½ in. 20 pp. Illustrated. Describes complete line of expansion bolts.

New Jersey Zinc Company, 160 Front St., New York, N. Y.
Zinc as a Paint Pigment. Technical treatise on the subject, with illustrations and reports of tests. 24 pp. 6 x 9 in.
Mapaz No. 1 Painting Handbook. Pocket size combination handbook and notebook containing valuable information on Zinc Oxide and its use in paint. Other data of interest to architects, including lace stencils, color formulæ, etc.

Pittsburgh Plate Glass Co., Pittsburgh.
Glass, Paints, Varnishes and Brushes. Book, 9 x 11 in. 190 pp. An extremely fine treatise on the history, manufacture, and use of these commodities.

The Ripolin Company, Cleveland, Ohio.
Ripolin Specifications. Book. 8 x 10¼ in. 12 pp. Complete specifications and general instructions for the application of Ripolin, the original Holland enamel paint. Also directions for proper finishing of wood, metal, plaster, concrete, brick and other surfaces.
Why Ripolin Has an International Reputation. 8 x 10¾ in. 24 pp. Designed for the architect's files to illustrate the many varied uses of Ripolin Enamel Paint in all parts of the world. Profusely illustrated.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Preservative Coating. Booklet. 6 x 9 in. 15 pp. Illustrated. Presents in a concise manner the properties and uses of the Ruberoid Company's various paint preparations.

Sherwin-Williams Company, 601 Canal Rd., Cleveland, Ohio.
Painting Concrete and Stucco Surfaces. Bulletin No. 1. 8½ x 11 in. 8 pp. Illustrated. A complete treatise with complete specifications on the subject of Painting of Concrete and Stucco Surfaces. Color chips of paint shown in bulletin.
Enamel Finish for Interior and Exterior Surfaces. Bulletin No. 2. 8½ x 11 in. 12 pp. Illustrated. Thorough discussion including complete specifications for securing the most satisfactory enamel finish on interior and exterior walls and trim.
Painting and Decorating of Interior Walls. Bulletin No. 3. 8½ x 11 in. 20 pp. Illustrated. An excellent reference book on Flat Wall Finish including texture effects which are taking the country by storm. Every architect should have one on file.
Protective Paints for Metal Surfaces. Bulletin No. 4. 8½ x 11 in. 12 pp. Illustrated. A highly technical subject treated in a simple, understandable manner.

Sonneborn Sons, Inc., L., Dept. 4, 116 Fifth Avenue, New York.
Paint Specifications. Booklet. 8½ x 10¾ in. 4 pp.

PANELING—See Millwork

PARTITIONS

Circle "A" Products Corporation, Champaign, Ill.
Catalog. 11⅛ x 8⅝ in. 28 pp. Illustrated. Gives information data and illustration of Circle "A" Sectional Office Partitions.
Erection Instructions for Ceiling Height Partitions, Sectional and Removable. Folder. 8½ x 11 in. Illustrated with drawings.
Erection Instructions for Seven-Foot Partitions Sectional and Removable. Folder. 8½ x 11 in. Illustrated with drawings.

Improved Office Partition Company, 25 Grand St., Elmhurst, L. I.
Telesco Partition. Catalog. 8¼ x 11 in. 14 pp. Illustrated. Shows typical offices laid out with Telesco partitions, cuts of finished partition units in various woods. Gives specifications and cuts of buildings using Telesco.
Detailed Instructions for erecting Telesco Partitions. Booklet. 24 pp. 8½ x 11 in. Illustrated. Complete instructions, with cuts and drawings, showing how easily Telesco Partition can be erected.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Partitions. Booklet. 7 x 10 in. 32 pp. Illustrated. Describes complete line of track and hangers for all styles of sliding, parallel accordion and flush door partitions.

U. S. Gypsum Co., Chicago.
Pyrobar Partition and Furring Tile. Booklet. 8½ x 11 in. 24 pp. Illustrated. Describes use and advantages of hollow tile for inner partitions.

Wilson Corporation, J. G., 11 East 36th Street, New York, N. Y.
Sectionfold and Rolling Partitions and Hygienic School Wardrobes. Catalog No. 37. Booklet 8½ x 11 in. 40 pp. Illustrated. Describes the uses of rolling and sectional partitions, particularly in schools and churches. Also the installation of Wilson school wardrobes.

PIPE

American Brass Company, Waterbury, Conn.
Bulletin B-1. Brass Pipe for Water Service. 8½ x 11 in. 28 pp. Illustrated. Gives schedule of weights and sizes (I.P.S.) of seamless brass and copper pipe, shows typical installations of brass pipe, and gives general discussion of the corrosive effect of water on iron, steel and brass pipe.

A. M. Byers Company, 235 Water St., Pittsburgh, Pa.
Bulletin 26-A. What Is Wrought Iron? 8 x 10¾ in. 40 pp. Illustrated. Descriptions of materials and processes employed in manufacturing Byers genuine wrought iron pipe. Factors influencing corrosion. Gives table of pipe sizes, weights, dimensions, tests, etc., and tabulated records of the life of iron and steel pipe in various kinds of service.
Bulletin 30. An Investigation of Pipe Corrosion in Hot Water Service. 8 x 10¾ in. 20 pp. Illustrated. Shows service records of iron, steel and brass pipe used for hot and cold water supply lines in 129 Pittsburgh apartment buildings.
Bulletin 32. Corrosion of Wrought Iron, Cast Iron and Steel Pipe in House Drainage Systems. 8 x 10¾ in. 32 pp. Illustrated. Data obtained through investigations conducted in New York and Chicago by Dr. Wm. P. Gerhardt, C. E. and Thomas J. Claffy, Asst. Chief San. Inspector, City of Chicago.
Bulletin 38. The Installation Cost of Pipe. 32 pp. 8 x 10¾ in. Illustrated. Cost analysis of 20 different pipe installations, in power and industrial plants, office buildings, hotels, residences, etc.

Hockadayed for utmost cleanliness and sanitation—the Guaranty Bldg., Philadelphia
Charles E. Ochlschlager, Architect

The Master Paint of the Century

—and 9 Reasons Why

"Hockaday or its equal." It has come about that this comparative merit clause is now often inserted in painting specifications as a protection and insurance of a 100% job. Why? Because other paints so often "flivver" and because Hockaday has been proved the *only* paint which will at all times, when properly applied, live up to the "*nine points of superiority*" forever fixed as the Hockaday standard by its makers. You CAN'T find its equal. Read and check against other paint performance as you have observed it—

Hockaday painted walls will *not* show limeburn
Hockaday painted walls will *not* air check
Hockaday painted walls will *not* peel
Hockaday paint needs *no* size or primer
Hockaday paint needs *no* brushing. Flow it on
Hockaday paint spreads over *more* surface
Hockaday paint dries *quicker*
Hockaday walls can be *washed* clean
Hockaday paint *lasts* six to twelve years

Our big illustrated book, "Solving Your Painting Problems" covers each point in detail—the illuminating facts about Hockaday, the Master Paint of the Century.

Complete Specifications, Page 1352, Sweet's Catalog

THE HOCKADAY COMPANY, 1223-1229 Carroll Ave., CHICAGO

HOCKADAY

THE WASHABLE PAINT FOR ALL INTERIORS

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 108*

PIPE—Continued

Chase Metal Works, Waterbury, Conn.
Why Brass Pipe. Booklet. 6¼ x 3⅜ in. 6 pp. Small pamphlet showing advantages of brass pipe in concise form, together with table of standard sizes and weights.

Clow & Sons, James B., 534 S. Franklin St., Chicago, Ill.
Catalog "A," 4 x 6½ in. 700 pp. Illustrated. Shows a full line of steam, gas and water works supplies.

National Tube Co., Frick Building, Pittsburgh, Pa.
"National" Bulletin No. 2. Corrosion of Hot Water Pipe. (8½ x 11 in. 24 pp.) Illustrated. In this bulletin is summed up the most important research dealing with hot water systems. The text matter consists of seven investigations by authorities on this subject.
"National" Bulletin No. 3. The Protection of Pipe Against Internal Corrosion (8½ x 11 in. 20 pp.) Illustrated. Discusses various causes of corrosion, and details are given of the deactivating and deaerating systems for eliminating or retarding corrosion in hot water supply lines.
"National" Bulletin No. 25. "National" Pipe in Large Buildings. 8½ x 11 in. 88 pp. This bulletin contains 254 illustrations of prominent buildings of all types, containing "National" Pipe and considerable engineering data of value to architects, engineers, etc.
Modern Welded Pipe. Book of 88 pages (8½ x 11 in.), profusely illustrated with halftone and line engravings of the important operations in the manufacture of pipe.

Reading Iron Company, Reading, Pa.
Reading Genuine Wrought Iron Pipe in the Making and in Service. Bulletin No. 1. 8½ x 11 in. 32 pp. Illustrated. History of the Reading Iron Company. Origin of wrought iron—description of each process of manufacture of both buttweld and lapweld pipe—Reading Pipe in various fields.
Book of Standards. Booklet. 5 x 7 in. 48 pp. Illustrated. Complete tables showing dimensions, tests and list prices on each of the 552 different kinds of Reading Tubular goods. Two simple tests for distinguishing genuine wrought iron pipe.
The Painted Molecule. Booklet. 4 x 9 in. 8 pp. Illustrated. A brief, non-technical description of the reasons for the longer life of Reading Iron Pipe, with instances of actual service.
The Ultimate Cost. Booklet. 5¼ x 7¼ in. 24 pp. Illustrated in two colors. A comparison in actual figures of the initial cost and the ultimate cost of plumbing and heating systems in several kinds of homes.

Grinnell Company, 285 West Exchange Street, Providence, R. I.
Grinnell Bulletin Booklet. 10½ x 7¾ in. Illustrated. Issued monthly. Describes and illustrates the different Grinnell products.

PLUMBING EQUIPMENT

American Brass Company, Waterbury, Conn.
Benedict Nickel. Illustrated pamphlet descriptive of Benedict Nickel White Metal for high grade plumbing fixtures.

Brunswick-Balke-Collender Co., 623 S. Wabash Ave., Chicago, Ill.
Whale-bone-ite Seat. Booklet. 3½ x 6¼ in. 4 pp. Illustrated.

Clow & Sons, James B., 534 S. Franklin Street, Chicago, Ill.
Catalog "M." 9¼ x 12 in. 184 pp. Illustrated. Shows complete line of plumbing fixtures for Schools, Railroads and Industrial Plants.

Crane Company, 836 S. Michigan Avenue, Chicago, Ill.
Crane Products in World Wide Use. Catalog. 5 x 9½ in. 24 pp. Illustrated.
Plumbing Suggestions for Home Builders. Catalog. 3 x 6 in. 80 pp. Illustrated.
Plumbing Suggestions for Industrial Plants. Catalog. 4 x 6½ in. 43 pp. Illustrated.

Douglas Co., The John, Cincinnati, Ohio.
Catalog "C." 10½ x 8 in. 200 pp. Illustrated. Illustrates and describes the Douglas complete line of China Sanitary plumbing fixture.
Booklet. Douglas Suggests for your Home. 6 x 3½ in. 39 pp. Illustrated.

Eljer Company, Fort City, Pa.
Complete Catalog. 3¾ x 6¾ in. 104 pp. Illustrated. Describes fully the complete Eljer line of standardized vitreous china plumbing fixtures, with diagrams, weights and measurements.
Standardized Sixteen. Circular. 3¾ x 6¾ in. 18 pp. Illustrated.

Kohler Co., Kohler, Wis.
Catalog F. 7½ x 10⅝ in. 216 pp. Illustrates and describes the complete line of Kohler trade-marked plumbing ware.
Roughing-In Measurement Binder. 5 x 8 in., containing loose leaf sheets on all staple fixtures.

Maddock's Sons Company, Thomas, Trenton, N. J.
Catalog K. 10⅞ x 7⅞ in. 242 pp. Illustrated. Complete data on vitreous china plumbing fixtures with brief history of Sanitary Pottery.

Speakman Company, Wilmington, Del.
Speakman Showers and Fixtures. Catalog. 4½ x 7½ in. 250 pp. Illustrated. Catalog of Modern Showers and Brass Plumbing Fixtures, with drawings showing layouts, measurements, etc.
Toned Up in Ten Minutes. Booklet. 7½ x 10½ in. 16 pp. Illustrated. Modern Showers and Washups for Industrial Plants, showing the sanitary method of washing in running water.

PUMPS

Chicago Pump Company, 2300 Wolfram Street, Chicago, Ill.
The Correct Pump to Use. Portfolio containing handy data. Individual bulletins, 8½ x 11 in., on bilge, sewage, condensation, circulating, house, boiler feed and fire pumps.

Goulds Mfg. Co., The, Seneca Falls, N. Y.
Set of Twenty Bulletins, 7½ x 10⅝ in. 12 to 32 pp. each. Illustrated. Covers complete line of power and centrifugal pumps for all services.

Kewanee Private Utilities Co., 442 Franklin St., Kewanee, Ill.
Bulletin E. 7¾ x 10¼ in. 32 pp. Illustrated. Catalog. Complete descriptions, with all necessary data, on Standard Service Pumps, Indian Brand Pneumatic Tanks, and Complete Water Systems, as installed by Kewanee Private Utilities Co.

RAMPS

Ramp Buildings Corporation, 115 Broad St., New York, N. Y.
The d'Humy Motoramp System of Building Design. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describes the d'Humy system of ramp construction for garages, service buildings, factories, warehouses, etc., where it is desirable to drive motor vehicles or industrial tractors under their own power from floor to floor.
Storage Efficiency of Multi-Floor Garages. Leaflet. 8½ x 11 in. 4 pp. Illustrated. A brief discussion of comparative storage efficiencies of elevator garages, ordinary ramp garages, and d'Humy Motoramp garages.
Visibility. Pamphlet. 8½ x 11 in. 2 pp. Illustrated. Discussion of visibility feature of d'Humy Motoramp System with reference to illustration of one particular installation.
Series of Informal Bulletins on Garage Design. Sent upon request.

REINFORCED CONCRETE—See also Construction, Concrete

The General Fireproofing Company, Youngstown, Ohio.
Self-Sentering Handbook. 8½ x 11 in. 36 pp. Illustrated. Methods and specifications on reinforced concrete floors, roofs and floors with a combined form and reinforced material.

Truscon Steel Company, 250 W. Lafayette Blvd., Detroit, Mich.
Shearing Stresses in Reinforced Concrete Beams. Booklet. 8½ x 11 in. 12 pp.

North Western Expanded Metal Company, Chicago, Ill.
Designing Data. Book. 6 x 9 in. 96 pp. Illustrated. Covers the use of Econo Expanded Metal for various types of reinforced concrete construction.

ROOFING

American Brass Company, Waterbury, Conn.
Service Sheets 43-1 and 43-2, standard specifications and methods of laying copper roofings, flashings, hips, valleys, decks, gutters and leaders.

American Sheet & Tin Plate Co., Frick Bldg., Pittsburgh, Pa.
Better Buildings. Catalog. 8½ x 11 in. 32 pp. Describes Corrugated and Formed Sheet Steel Roofing and Siding Products, black, painted and galvanized, with directions for application of various patterns of Sheet Steel Roofing in various types of construction.
Copper—Its Effect Upon Steel for Roofing Tin. Catalog. 8½ x 11 in. 28 pp. Illustrated. Describes the merits of high-grade roofing tin plates and the advantages of the copper-steel alloy.
The Testimony of a Decade. Booklet. 8½ x 11 in. 16 pp., with Graphic Chart and illustration showing losses to various Iron and Steel Sheets for roofing, from atmospheric corrosion.

Philip Carey Co., Lockland, Cincinnati, Ohio.
Architects' Specifications for Carey Built-up Roofing. Booklet. 8 x 10¾ in. 24 pp. Illustrated. Complete data to aid in specifying the different types of built-up roofing to suit the kind of roof construction to be covered.
Carey Built-up Roofing for Modern School Buildings. Booklet. 8 x 10¾ in. 32 pp. Illustrated. A study of school buildings of a number of different kinds and the roofing materials adapted for each.

Federal Cement Tile Co., 110 So. Dearborn St., Chicago, Ill.
The Indestructible Roof. Booklet. 10 x 13 in. 32 pp. Illustrated. Illustrates and describes the installation of permanent concrete interlocking tile, tile with glass insets, flat tile and channel tile, on all types of industrial plants and other buildings with flat and pitched surfaces.
Standards. Booklet. 8½ x 11 in. 40 pp. Illustrated with full-page drawings. Gives full details of all forms of roof construction of steel structure, ridge and gutter construction, purlin arrangement, spacing, etc., for standard roofs.

Johns-Manville, Inc., Madison Ave. & 41st St., New York, N. Y.
Johns-Manville Building Materials. Book. 8½ x 11 in. 100 pp. Illustrated. A comprehensive catalog of various types of roofing for all forms of construction. Details of wall, floor and ceiling insulation; asbestos wood for fireproof construction; waterproofing, etc.
Johns-Manville Asbestos Shingles. Booklet. 8½ x 11 in. 24 pp. Illustrated. This booklet is profusely illustrated in colors, showing some very artistic blends of asbestos shingles with various types of architecture. Contains many valuable suggestions for the architect.

Ludowici-Celadon Company. 104 So. Michigan Ave., Chicago, Ill.
"Ancient" Tapered Mission Tiles. Leaflet. 8½ x 11 in. 4 pp. Illustrated. For architects who desire something cut of the ordinary, this leaflet has been prepared. Describes briefly the "Ancient" Tapered Mission Tiles, hand-made, with full corners and designed to be applied with irregular exposures.

Milwaukee Corrugating Co., Milwaukee, Wis.
The Milcor Architectural Sheet Metal Guide. Booklet. 8½ x 11 in. 64 pp. Illustrated. Gives valuable technical sheet metal data.

New Jersey Zinc Company, 160 Front St., New York, N. Y.
Standing Seam Horse Head Zinc Roofing. Booklet outlining the adaptability of this roofing for many types of buildings. Illustrated with sketches showing how roofing is applied. Also describes lasting qualities, appearance, etc.
Once in a Lifetime. Booklet describing conductors, gutters and standing seam roofing made from Horse Head Zinc. Contains information on their economy and durability. Illustrated.

Richardson Company, The, Lockland, Ohio.
Roofs of Distinction. Booklet. 5 x 6¾ in. 22 pp. Illustrated in 4 colors and black and white.
Gives process of roofing manufacture. Has color charts showing four shingles of different colors blended in same roof. Lists and describes Richardson Products.
Roofing on the Farm. Booklet. 5 x 6¾ in. 22 pp. Illustrated in 4 colors and black and white.
A solution to farm roofing problems.
Viskalt Roof Specifications. Booklet. 7 x 12 in. 10 pp. Illustrated. Specifications for applying Viskalt Membrane built on roofs.

Ted Starr doesn't want a cuff on his trousers

Jenkins, salesman at A. De Pinna, recognized his signal and stepped to the city phone. "Hello, Mr. Starr—Oh yes—you don't want a cuff? All right, hold the wire—I'll fix that in a minute." Setting down the receiver of the city phone, Jenkins dialled two figures on a handy P-A-X phone and spoke directly to the alteration department. "Never mind about the cuff on 7444A—" Then turning to the city phone—"All right, Mr. Starr—No trouble—Tomorrow sure. Goodbye."

Whether your client makes clothes, rubber tires or chewing gum, he will find that, like De Pinna, Goodyear and Wrigley, his organization will profit by the P-A-X.

By means of the P-A-X, customers may talk to his entire organization through him. While they hold the city wire he can dial any department and get information for them. No calling back. Service like this builds business.

For 24 hours a day the P-A-X handles all inter-communication calls instantly and accurately. There is no operator to delay connections, give the wrong number, or to "listen in" on conversations.

Besides Interior Telephony, the Automatic Electric Services of the P-A-X include Code Call, Conference Wire, Executives' Priority Service, etc. For nearly 2,000 organizations in every field of business, the P-A-X has proved itself a vital necessity and actually paid for itself in a short time by saving operators' salaries.

The P-A-X is similar to the Automatic Telephone equipment being so widely adopted for city service. It augments and completes but neither supplants nor connects with local or long distance telephone service.

Automatic Electric Company

Originators of the P-A-X. For more than 30 years the engineers, designers and manufacturers of the Automatic Telephone in use the world over. Home Office and Factory, Chicago, Ill., Branch Offices: NEW YORK, 21 East Fortieth St.; CLEVELAND, Cuyahoga Bldg. Representatives in all principal cities. *In Canada—Address:* Northern Electric Co., Ltd., 121 Shearer St., Montreal, P. Q. *Abroad—Address:* International Automatic Telephone Co. Norfolk House, Norfolk St., Strand, London, W. C. 2, England. *In Australia—Address:* Automatic Telephones, Ltd., Mendes Chambers, Castlereagh St., Sydney, Australia.

P-A-X TRADE MARK

PRIVATE AUTOMATIC EXCHANGE

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS—*Continued from page 110*

ROOFING—Continued

A Specific Way to Outwit the Weather. Booklet. 10 x 12 in. 4 pp. Illustrated.
Treatise on recoating old roofs.

Ruberoid Co., The (formerly the Standard Paint Co.), 95 Madison Avenue, New York, N. Y.
Instructions for Laying Built-up Roofs. Booklet. 8½ x 11 in. Illustrated.
Ruberoid Strip-Shingle. Booklet. 3½ x 6¼ in. 16 pp. Illustrated in color.

United Alloy Steel Corporation, Canton, Ohio.
Better Sheet Metal. 8½ x 11 in. 128 pp. and cover. Illustrated. Shows the many uses of Toncan Metal with many pictures of buildings, names of architects, etc., also tables of weights and other useful specification data.

U. S. Gypsum Co., Chicago.
Pyrobar Roof Construction. Booklet. 8 x 11 in. 48 pp. Illustrated. Gives valuable data on the use of tile in roof construction.
Sheetrock Pyrofill Roof Construction. Folder. 8½ x 11 in. Illustrated. Covers use of roof surfacing which is poured in place.

Weatherbest Stained Shingle Co., Inc., North Tonawanda, N. Y.
The Construction of Weatherbest Thatch Roofs. Booklet. 8 x 11 in. 16 pp. Illustrated. A well written, carefully prepared book giving in detail the proper construction for securing the Thatch Effect roof by the use of WEATHERBEST Stained Shingles. Contains full-page reproductions of WEATHERBEST homes and drawings showing detail of roof construction.
Various Pamphlets. Illustrated. Each pamphlet exemplifies some specific quality of WEATHERBEST Stained Shingles used for roofs and sidewalls.

RUGS, IMPORTED

Kent-Costikyan Trading Company, Inc., 484 Fifth Ave., New York, N. Y.
Rugs. Catalogue. 9½ x 6½. 56 pp. Illustrated. Illustrates and describes an unusual collection of Oriental and Occidental rugs with stock list.

SASH CHAIN

American Chain Company, Inc., Bridgeport, Conn.
American Sash Chain. Booklet. 6 x 9. 16 pp. Illustrated. Describes and illustrates American Sash Chain and Sash Fixtures.

Smith & Egge Mfg. Co., The, Bridgeport, Conn.
Chain Catalog. 6 x 8½ in. 24 pp. Illustrated. Covers complete line of chains.

SASH CORD

Samson Cordage Works, Boston, Mass.
Catalog. 3½ x 6¾ in. 24 pp. Illustrated. Covers complete line of rope and cord.

SCREENS

Athey Company, 6015 West 65th St., Chicago, Ill.
The Athey Perennial Window Shade. An accordian pleated window shade, made from translucent Herringbone woven Coutil cloth, which raises from the bottom and lowers from the top. It eliminates awnings, affords ventilation, can be dry-cleaned and will wear indefinitely.

The Higgin Manufacturing Co., Newport, Ky.
Your Home Screened the Higgin Way. Booklet. 8½ x 11½ in. 13 pp. Illustrated in colors. Complete description of Higgin Screens, designed to meet every need.

New Jersey Wire Cloth Co., Trenton, N. J.
A matter of Health and Comfort. Booklet. 5 x 7¾ in. 16 pp. Illustrated. Discusses quality in wire insect screen cloth.

SEWAGE DISPOSAL

Kewanee Private Utilities, 442 Franklin St., Kewanee, Ill.
Specification Sheets, 7¾ x 10¼ in. 40 pp. Illustrated Detailed drawings and specifications covering water supply and sewage disposal systems.

SHEATHING

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STAINS—See Paints, Varnishes, Wood Finishes

STEEL COMPARTMENTS

Henry Weis Mfg. Co., Atchison, Kan.
Catalog No. 11, 1923 Edition. 8½ x 11 in. 32 pp. Illustrated. Shows toilet, shower and dressing-room compartment, and Hospital Cubical installations in all types of buildings; describes "WEISTEEL" compartments in detail; gives complete specifications and suggested specifications for architects' use; includes blueprints of suggested layouts, lists of standard sizes and units.

STONE, BUILDING

Indiana Limestone Quarrymen's Association, Box 766, Bedford, Ind.
Volume 3, Series A-3. Standard Specifications for Cut Indiana Limestone work. 8½ x 11 in. 56 pp. Containing specifications and supplementary data relating to the best methods of specifying and using this stone for all building purposes.
Vol. 1. Series B. Indiana Limestone Library. 6 x 9 in. 36 pp. Illustrated. Giving general information regarding Indiana Limestone, its physical characteristics, etc.
Vol. 4. Series B. Booklet. New Edition. 8½ x 11 in. 64 pp. Illustrated. Indiana Limestone as used in Banks.
Volume 5. Series B. Indiana Limestone Library. Portfolio. 11⅜ x 8¾ in. Illustrated. Describes and illustrates the use of stone for small houses with floor plans of each.

STORE FRONTS

Brasco Manufacturing Co., 5025-35 South Wabash Avenue, Chicago, Ill.
Portfolio. 8½ x 11 in. 32 pp. Illustrated. Selected examples of Brasco Copper Store Fronts suitable for different businesses and varying conditions of locations.
Catalogue 28. 8½ x 10¾ in. 20 pp. Illustrated with plates. Details of Brasco Copper Store front construction. Also showcases, ventilator sashes.
Detail Sheets. Set of five sheets giving details and suggestions for store front designing enclosed in envelope convenient for filing.

STORE FRONTS—Continued

Kawneer Co., The, Niles, Mich.
A Collection of Successful Designs. Catalog. 9¼ x 6½ in. 64 pp. Illustrated. Showing by use of drawings and photographs many types of Kawneer Solid Copper Store Fronts.

Zouri Drawn Metals Company, Chicago Heights, Ill.
Zouri Safety Key-Set Store Front Construction. Catalogue. 8½ x 10½ in. 60 pp. Illustrated. Complete information with detailed sheets and installation instructions convenient for architects' files.
International Store Front Construction. Catalogue. 8½ x 10 in. 70 pp. Illustrated. Complete information with detailed sheets and installation instructions convenient for architects' files.

STUCCO

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
For All Time and Clime. Booklet. 6 x 9 in. 48 pp. Illustrated. Describing the use of Bishopric stucco base and Bishopric plaster base.

STUCCO BASES

Bishopric Manufacturing Co., 103 Este Ave., Cincinnati, Ohio.
Specifications and Working Details. Booklet. 7¾ x 10½ in. Illustrated. Contains plainly written instructions for the use of stucco, stucco base, plaster base and insulation base.

STUCCO, MAGNESITE

American Magnestone Corporation, Springfield, Ill.
Catalog. 13 pp. Describes the quality, beauty and strength of Magnestone.

Muller & Co., Franklyn R., Waukegan, Ill.
Everlastic Magnesite Stucco. Booklet. 8½ x 11 in.

TERRA COTTA

National Terra Cotta Society, 19 West 44th St., New York, N. Y.
Standard Specification for the Manufacturer. 8½ x 11 in. 12 pp. Furnishing and Setting of Terra Cotta, consisting of complete detail Specification, Glossary of Terms Relating to Terra Cotta and Short Form Specification for incorporating in Architect's Specifications.
Color in Architecture. Illustrated brochure 8½ in. containing a treatise upon the basic principles of color in architectural design, illustrating early European and modern American examples.
Present Day Schools. 8½ x 11 in. 32 pp. Illustrating 42 examples of school architecture with article upon school building design by James O. Betelle, A. I. A.
Better Banks. 8½ x 11 in. 32 pp. Illustrating many banking buildings in terra cotta with an article on its use in bank design by Alfred C. Bossom, Architect.

Northwestern Terra Cotta Co., The, 2525 Clybourn Ave., Chicago, Ill.
Booklet. 8¼ x 11 in. 77 pp. Illustrated. Showing in a concise way the usefulness of terra cotta.

TERRAZZO

Galassi Company, 153 East 38th Street, New York, N. Y.
Suggesting a Standard Specification for Terrazzo Work Booklet. Specifications for the use of terrazzo.

THERMOSTATS—See Heating Equipment

TILE, FLOOR AND WALL

Associated Tile Manufacturers, The, Beaver Falls, Pa.
Basic Information Booklet. 7½ x 10⅝ in. 24 pp. Illustrated. Ask for Booklet K-200.
A publication issued for architects, engineers and educators to acquaint them with methods of grading, derivation of sizes and shapes, variety of colors, kind of finishes, nomenclature and ingredients and processes insofar as they lead to a better understanding of the product and its uses.
Basic Specifications and Related Documents, Booklet. 7½ x 10⅝ in. 38 pp. Ask for Booklet K-300.
The Basic Specification proper gives in detail the procedure to be followed with respect to any kind of tile installation in connection with practically every type of construction. The Related Documents or work sheets are designed to call attention to optional application methods and materials.
Swimming Pools. Booklet. 8½ x 11 in. 32 pp. Illustrated. Issued for the use of architects and engineers as a handbook on swimming pools and their construction.
Bringing the Crowds to Your Market. Booklet. 8½ x 11 in. 16 pp. Illustrated in color. Shows use of tile for the modern sanitary market.

TILE, HOLLOW

National Fire Proofing Co., 250 Federal St., Pittsburgh, Pa.
Standard Wall Construction Bulletin 174. 8½ x 11 in. 32 pp. Illustrated. A treatise on the subject of hollow tile wall construction.
Natco on the Farm. 8½ x 11 in. 38 pp. Illustrated. A treatise on the subject of fire safe and permanent farm building construction.
Natco Homes and Garages. Booklet. 7 x 10 in. 32 pp. Illustrated. Showing the use of Natco Hollow Tile for private residences.

VACUUM CLEANING APPARATUS

The Spencer Turbine Company, Hartford, Conn.
Vacuum Cleaning Apparatus for all purposes. Booklet. 32 pp. Illustrated. Complete information on product, showing prominent buildings equipped with this system.

VALVES

Crane Co., 836 S. Michigan Ave., Chicago, Ill.
No. 50 Steam Pocket Catalog. 4 x 6½ in. 775 pp. Illustrated. Describes the complete line of the Crane Co.

Gorton & Lidgerwood Co., 96 Liberty St., New York, N. Y.
Gorton Quarter-Turn Packing-Lock Valves. Booklet. 4¼ x 7¼ in. 32 pp. Illustrated. Describing a new type of valve for all systems of steam, hot water and vacuum heating.

Illinois Engineering Co., Racine Ave., at 21st St., Chicago, Ill.
Catalogue. 8½ x 11 in. 88 pp. Illustrated.

ST. LOUIS
UNIVERSITY
DENTAL SCHOOL

Roofed with Carey Built-up Roof. Specification No. 7

Widmer Engineering Co.
Architects, Engineers

A Practical Investment

HERE is a college building without aspiring towers, nor verdant campus lawns.

The building is designed to give the utmost service for the money invested. It is permanent. Good materials make it so. The investment has been concentrated on practical purposes.

A Carey built-up roof was the natural and logical choice because it is supremely good, and gives not only the longest service, but the utmost service in the long run per dollar of cost.

There is a Carey roof for *every* building just as this particular Carey roof is ideal for *this* building.

THE PHILIP CAREY COMPANY
504-524 Wayne Ave., Lockland, Cincinnati, O.

A Roof for Every Building

Carey
BUILT-UP ROOFS

14-24

SELECTED LIST OF MANUFACTURERS' PUBLICATIONS — *Continued from page 112*

VALVES—Continued

Jenkins Bros., 80 White Street, New York.
The Valve Behind a Good Heating System. Booklet 4½ x 7¼ in. 16 pp. Color plates. Description of Jenkins Radiator Valves for steam and hot water, and brass valves used as boiler connections.
Jenkins Valves for Plumbing Service. Booklet. 4½ x 7¼ in. 16 pp. Illustrated. Description of Jenkins Brass Globe, Angle Check and Gate Valves commonly used in home plumbing, and Iron Body Valves used for larger plumbing installations.

VARNISH—See Paints, Stains, Varnishes

VENETIAN BLINDS

Burlington Venetian Blind Co., Burlington, Vt.
Venetian Blinds. Booklet. 4½ x 7½ in. 32 pp. Illustrated. Describes the "Burlington" Venetian blinds, method of operation, advantages of installation to obtain perfect control of light in the room.

VENTILATION

Globe Ventilator Company, 205 River Street, Troy, N. Y.
Globe Ventilators Catalog. 6 x 9 in. 32 pp. Illustrated profusely. Catalog gives complete data on "Globe" ventilators as to sizes, dimensions, gauges of material and table of capacities. It illustrates many different types of buildings on which "Globe" ventilators are in successful service, showing their adaptability to meet varying requirements.

Van Zile Ventilating Corporation, 280 Madison Avenue, New York, N. Y.
The Ventadoor Booklet. 6½ x 3½ in. 16 pp. Illustrated. De-Describes and illustrates the use of the Ventadoor for Hotels, Clubs, Offices, etc.

WALL PAPER

W. H. S. Lloyd Company, 105-7 West 40th St., New York City.
Architects' Book. 301 pp. 8 x 5¾ in. Illustrated. Architects find this book of great service in selecting grades of wall paper. While it shows but a very limited selection of Lloyd Papers, it gives a fair idea of their quality, patterns and colors.

WATERPROOFING

Carey Company, The Philip, Lockland, Cincinnati, Ohio.
Waterproofing Specification Book. 8½ x 11 in. 52 pp.

The General Fireproofing Company, Youngstown, Ohio.
Waterproofing Handbook. Booklet. 8½ x 11 in. 72 pp. Illustrated. Thoroughly covers subject of waterproofing concrete, wood and steel preservatives, dustproofing and hardening concrete floors, and accelerating the setting of concrete. Free distribution.

Ruberoid Co., The, 95 Madison Ave., New York.
Impervite. Circular. 8½ x 11 in. 4 pp. Illustrated. An integral water-proofing compound for concrete, stucco, cement, mortar, etc.

Sandusky Cement Co., Dept. F, Cleveland, Ohio.
Medusa Waterproofing. Booklet. 6¾ x 9 in. 38 pp. Illustrated.

Sonneborn Sons, Inc., L., 116 Fifth Ave., New York, N. Y.
Pamphlet. 3¾ x 8¾ in. 8 pp. Explanation of waterproofing principles. Specifications for waterproofing walls, floors, swimming pools and treatment of concrete, stucco and mortar.

WATER PURIFIERS

Wallace & Tiernan Company, Newark, N. J.
Protecting N. Y. Water Supply. Booklet. 10 x 7 in. 24 pp. Illustrated. Describes the chlorinating equipment used for sterilizing N. Y. City water supply; also equipment suitable for sterilizing water supplies of municipalities, industrial plants, private residences, etc.

WATER SOFTENERS

Permutit Company, The, 440 Fourth Ave., New York, N. Y.
Permutit-Water softened to No (Zero) Hardness. Booklet. 8½ x 11 in. 32 pp. Describing the original Zeolite process of softening water to zero hardness. An essential for homes, hotels, apartment houses, swimming pools, laundries, textile mills, paper mills, ice plants, etc., in hard water districts.

WEATHER STRIPS

Monarch Metal Products Co., 5000 Penrose St., St. Louis, Mo.
Monarch Metal Weatherstrips, A. I. A. Class 19 e 14. Manual. 7½ x 10¾ in. 48 pp. Illustrated. Designed for architects and specification writers, showing details of windows, doors and other openings and the proper manner of installing Monarch strips. It also shows various strips made by this company. Fourteen pages are devoted to window leakage and radiation calculations.

The Higgin Manufacturing Co., Newport, Ky.
Higgin All-Metal Weather Strips. Booklet. 6 x 9 in. 21 pp. Illustrated in colors. Describes various types of Higgin Weather Strips for sealing windows and doors against cold and dust.

WINDOW HARDWARE, CASEMENT

Hoffman Mfg. Co., Andrew, 900 Steger Bldg., Chicago, Ill.
Hoffman Casement Fixtures. Architects' Portfolio. 8½ x 11 in. 30 pp. Loose-leaf. Scale details for mill-work, installation, etc., in new and old work.

International Casement Company, Jamestown, N. Y.
International Casements. Catalog. 8½ x 11 in. 224 pp. Illustrated. Valuable book, containing photographs and measured drawings of all types of buildings, showing casement windows.

Monarch Metal Products Co., 5000 Penrose St., St. Louis, Mo.
Monarch Casement Hardware. A. I. A. Class 27 c. 2. Manual. 7½ x 10¾ in. 20 pp. Shows details of casement windows and manner of installing Monarch casement hardware, for both outswinging and inswinging types. Monarch control locks are designed for installation under sill and to operate outswinging casements without removing screens.

Richards-Wilcox Mfg. Co., Aurora, Ill.
Casement Window Hardware. Booklet. 24 pp. 8½ x 11 in. Illustrated. Shows typical installations, detail drawings, construction details, blue-prints if desired. Describes AiR-way Multifold Window hardware.

WINDOWS, CASEMENT

Crittall Casement Window Co., 10951 Hearn Ave., Detroit, Mich.
Catalog No. 22. 9 x 12 in. 76 pp. Illustrated. Photographs of actual work accompanied by scale details for casements and composite steel windows for banks, office buildings, hospitals and residences.

Hoffman Mfg. Co., Andrew, 900 Steger Bldg., Chicago, Ill.
Hoffman Casements. Architects' Portfolio. 8½ x 11 in. 30 pp. Looseleaf. Scale dtails for mill-work, installation, etc., in new and old work.

Hope & Sons, Henry, 103 Park Ave., New York, N. Y.
Catalog. 12¼ x 18½ in. 30 pp. Illustrated. Full size details of outward and inward opening casements.

WINDOWS, STEEL AND BRONZE

Detroit Steel Products Company, Detroit, Mich.
Fenestra Basement Windows. Booklet. 3⅝ x 6¼ in. 16 pp. Illustrated. Describes steel basement windows, their advantages, details and specifications for installation.
Fenestra Reversible Ventilator Windows. Booklet. 8½ x 11 in. 20 pp. Illustrated. Describes the details of this new model window, as well as the variety it offers for attractive architectural design.
Fenestra Counter-Balanced Windows. Catalog. 8½ x 11 in. 111 pp. Illustrated. Details and specifications are thoroughly covered in the Fenestra General Catalog.
Fenestra Industrial Window Walls. Catalog. 8½ x 11 in. 111 pp. Illustrated. Details and specifications, with photographic illustrations, are thoroughly covered in the Fenestra General Catalog.

International Casement Company, Inc., Jamestown, N. Y.
Catalogue. 8½ x 11 in. 223 pp. Complete in its description of International Windows, detailed drawings, illustrations and specifications.
Booklet. 8 x 5 in. Prepared for the home builder and to assist the architect in presenting information on casement windows.
Folders. 8½ x 11 in. Detailed drawings and specifications on Austral windows for banks, industrial buildings and office buildings.

The Kawneer Company, Niles, Mich.
Kawneer Simplex Windows. Catalog. 8½ x 10½ in. 16 pp. Illustrated. Complete information, with measured details, of Kawneer Simplex Weightless Reversible Window Fixtures, made of solid bronze. Shows installations in residences and buildings of all sorts.
Detail Sheets and Installation Instructions. Valuable for architects and builders.

Truscon Steel Company, 250 W. Lafayette Blvd., Detroit, Mich.
Truscon Steel Windows. Catalog. 8½ x 11 in. 80 pp. Illustrated. Contains complete data on all types of Truscon Steel Windows.

WOOD—See also Millwork

American Walnut Mfrs. Association, 618 So. Michigan Blvd., Chicago, Ill.
American Walnut. Booklet. 7 x 9 in. 45 pp. Illustrated. A very useful and interesting little book on the use of Walnut in Fine Furniture with illustrations of pieces by the most notable furniture makers from the time of the Renaissance down to the present.
Real American Walnut Furniture. Folder. 8½ x 11 in. 4 pp. Illustrated. Tells how to identify the genuine and avoid the substitute in buying "Walnut" furniture.

California White and Sugar Pine Mfrs. Assn., San Francisco, Cal.
Information Sheet No. 1, California White Pine; Information Sheet No. 2, California Sugar Pine. Illustrated booklets 8 x 10½ in. First of a series of Information Sheets on these woods and their uses for construction and finish.

Curtis Companies Service Bureau, Clinton, Iowa.
Better Built Homes, Vols. XV-XVIII, incl. Booklet. 9 x 12 in. 40 pp. Illustrated. Designs for houses of five to eight rooms, respectively, in several authentic types, by Trowbridge & Ackerman, architects, for the Curtis Companies.

Long-Bell Lumber Co., Kansas City, Mo.
The Perfect Floor. Booklet 5¼ x 7¾ in., 16 pp. Illustrated. Valuable for the data given on the use of wood for floors.
Saving Home Construction Costs. Booklet 4⅛ x 7½ in. 24 pp. Discusses economy and value in domestic building.
Experiences in Home Building. Booklet 6 x 9 in. 16 pp. Records the testimony of a number of builders and contractors as to the value of certain materials.
The Post Everlasting. Booklet 8 x 11 in. 32 pp. Illustrated. Describes the production of posts and their use in various ways.

Mahogany Association, Inc., 1133 Broadway, New York.
Booklet. 6 x 8 in. "Stately Mahogany" giving a general description of mahogany, where found and its uses.
Booklet. 6 x 8 in. "Historic Mahogany." A monograph of period mahogany fully illustrated with pen drawings.
Booklet. 6 x 8 in. Architectural Woodwork of Mahogany. 32 pp., fully illustrated with photographs of mahogany panelings and containing much information of interest to architects.

Matthews Bros. Mfg. Company, Milwaukee, Wis.
Architectural Woodwork. Catalog. 9 x 12 in. 34 pp. Illustrated. This is the only catalog issued, and contains views showing both exteriors and interiors of banks, private residences, and office buildings in which this Company's woodwork has been installed.

Pacific Lumber Company, 332 So. Michigan Ave., Chicago, Ill.
California Redwood. Booklet. 9 x 12 in. 36 pp. Illustrated. Describes in a general way the production, manufacture and various uses of California Redwood.
Redwood Construction Digest. Booklet. 8½ x 11 in. 16 pp. Illustrated. Redwood and Its Uses in the Construction Field. Contains specifications and other information of interest to architects and builders generally.

WOOD FINISHES—See Paints, Varnishes, Stains

CALIFORNIA PINES PAINT PERFECTLY

California White Pine and California Sugar Pine are woods endowed by Nature with physical characteristics that make them unusually well suited to paint treatment.

California Pines are soft-textured and close even grained. Their use immediately eliminates the difficulties of hard layers or streaks, raised or wavy grain. They are readily dressed to a velvety, smooth surface, and assure a permanent flat painted finish.

These woods are practically free from pitch and resinous substances. This eliminates, at the outset, all dangers of discoloration from oils working through the paint or enamel.

Properly seasoned, California Pines have a minimum tendency to warp, shrink, or swell. This means they will "stay put"; seams and joints will not open up to leave unpainted strips exposed.

California Pines are light in color. They do not "oppose" the paint. For this reason, any color scheme may be successfully applied with an economy of time and materials —especially the prevailing light tones for interior and exterior painting.

California WHITE & SUGAR PINE

Manufacturers Association

654 CALL BLDG., SAN FRANCISCO

Also producers of

CALIFORNIA WHITE FIR CALIFORNIA DOUGLAS FIR CALIFORNIA INCENSE CEDAR

California White Pine
California Sugar Pine

A 200-year supply of these woods now stands in the region where our mills operate. Natural growth of standing timber, augmented by natural reproduction and reforestation, assures a supply of these valuable building woods for all time.

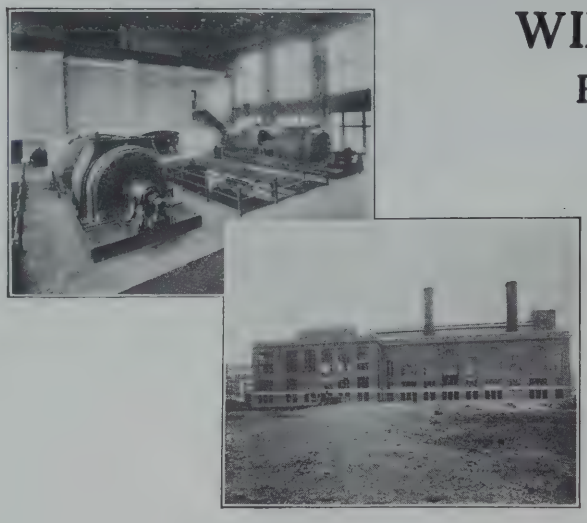
Exterior Uses: Siding and Trim, Porches, Columns, Entrance Doors, Frames and Sash, Pergolas, Trellis, Etc.

For the exquisite panelling, staircase and trim of the reception hall

California White Pine
California Sugar Pine

These woods are used more than any other wood for doors, sash, millwork and interior finish. Millions of doors and window sash and frames of California Pines are annually installed in the homes of America. Send for our free illustrated booklet, "Pine Homes."

Interior Uses: Panelling, Doors, French Doors, Finishing Woodwork, Moldings, Mantels, Bookcases, Built-in Closets, Etc.



WIRED WITH SIMPLEX

Penn. Central Power Co.

Saxton Substation

Day & Zimmermann, Inc., Engrs.

Simplex Wires and Cables are rendering satisfactory service in many of the larger power stations of the country. Insulated with rubber, paper or varnished cambric and covered with braid, lead or steel armor, they are made for the particular conditions under which they are installed.

Why not submit your specifications to us?

Simplex Wire & Cable Co.

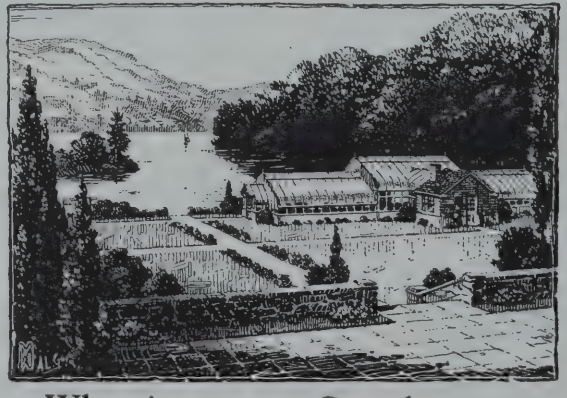
— *Manufacturers* —

201 Devonshire Street - Boston

Chicago
San Francisco
New York

Factory
and Main Office
at Boston

Hitchings Sunshine Shops



When it comes to Greenhouses
Come to

NEW YORK
101 Park Avenue

Hitchings and Company

BOSTON-9
161 Massachusetts Ave

General Offices and Factory: Elizabeth, N. J.

PHILADELPHIA
Empire Building
13th and Walnut Streets

WILKESBARRE, PA.
P. O. Box 218

Dr. Charles V. Paterno's Hudson View Gardens, Pinehurst to Northern Aves. and 182nd to 186th Sts., New York City. George F. Pelham, Architect.

Why Dr. Paterno's Masterpiece is Kernerator-Equipped

MAGNIFICENT Hudson View Gardens, Dr. Charles V. Paterno's new 354-apartment achievement, is 100 per cent Kernerator equipped! Naturally, the time-proven economy and convenience of the Kernerator exactly fitted Dr. Paterno's intention of creating a truly modern apartment community. Three hundred and fifty-four handy hopper doors—*one in each kitchen*—mean instant, right-at-hand garbage and waste disposal to every owner-tenant.

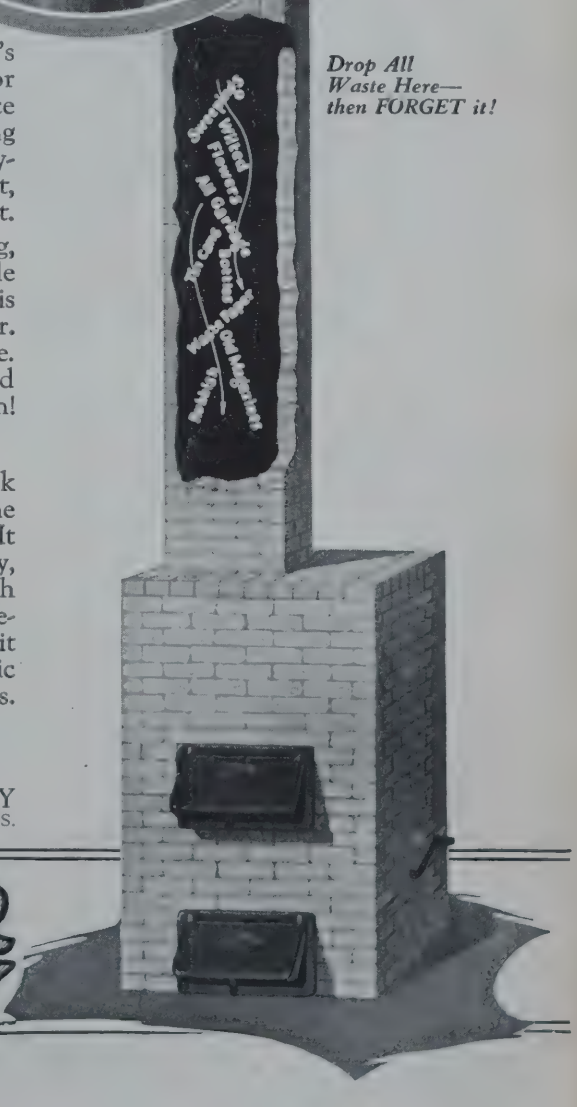
What an attraction to the buyer—and what a tremendous saving, too! No ill-smelling garbage pails at kitchen doors. No double or treble handling of garbage within the building before it is finally disposed of. No waiting for the tardy call of the janitor. No replacement of garbage pails either, for there are none. Just a neat, metal door into which every bit of household waste is dropped as fast as it accumulates—and then forgotten!

No Operating Cost—No Fuel Required!

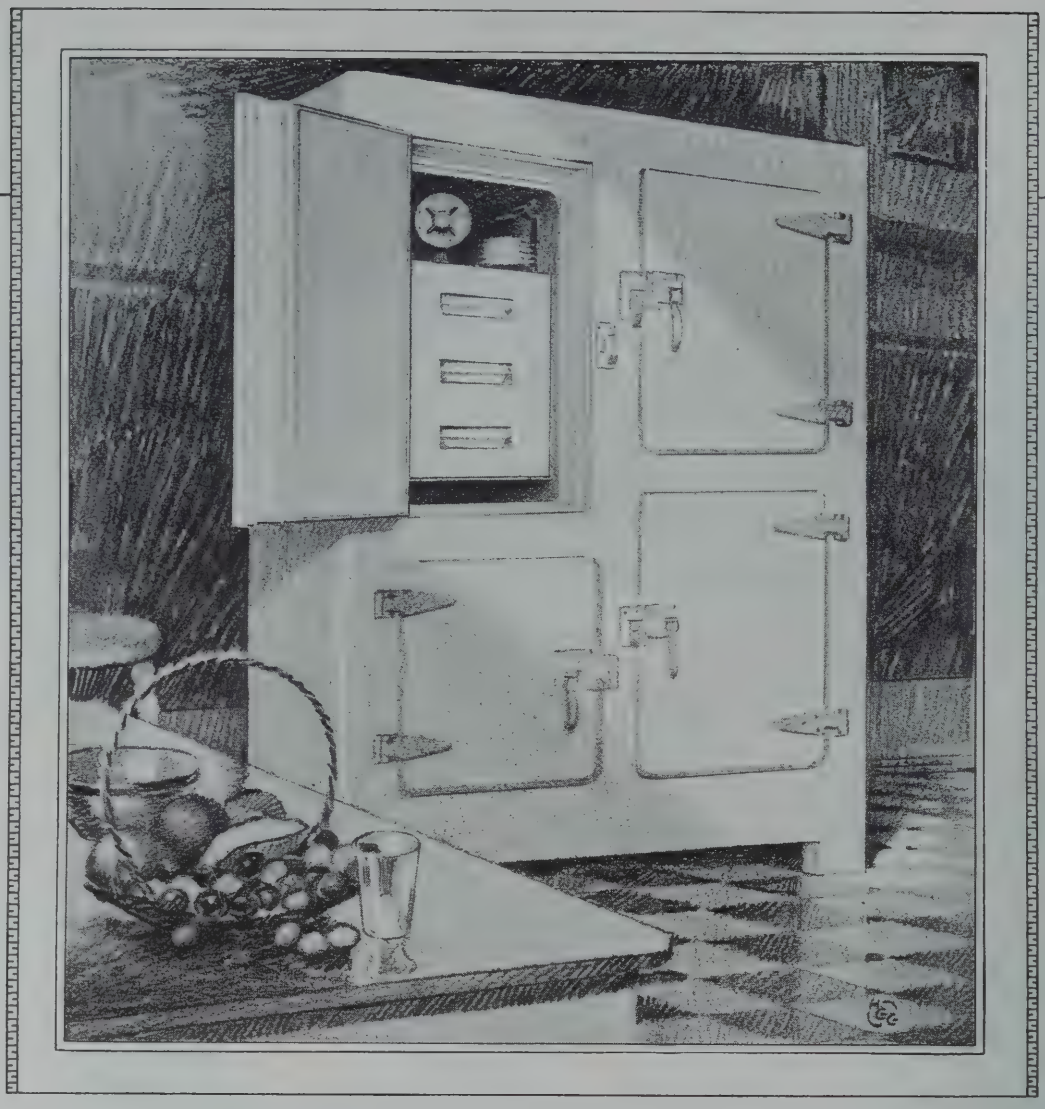
The Kernerator, as the cut-away view shows, consists of a brick combustion chamber, built in at the base of the chimney in the basement, and connecting with hopper doors on floors above. It handles *all* garbage, waste, tin cans, bottles, broken glass, crockery, papers and magazines, razor blades, sweepings—in fact, trash and refuse of every description. A patented, scientifically designed by-pass feature quickly air-dries the accumulation, so it lights easily and is readily burned. Non-combustibles, (metallic objects, etc.) are flame-sterilized and removed with the ashes.

For more detailed information, consult Sweet's (1924) Pages 2536-37, or write

KERNER INCINERATOR COMPANY
1015 CHESTNUT STREET MILWAUKEE, WIS.



KERNERATOR
Built-in-the-Chimney
Reg. U. S. Patent Office



The One Biggest Feature of electric refrigeration

When you tell a buyer that any appliance will last for years, he naturally asks for proof.

There is only one kind of proof that proves, and Kelvinator *alone* offers that.

Kelvinator points to installations that have been efficiently doing their work for years. These installations are in practically every community and your statements can be verified by the prospect.

Find, if you can, any stronger selling feature than that of Kelvinator's past performance.

KELVINATOR CORPORATION, 2035 WEST FORT STREET, DETROIT, MICHIGAN
Kelvinator of Canada, Ltd., 11 Temperance Street, Toronto (104)

Kelvinator

The Oldest Domestic Electric Refrigeration

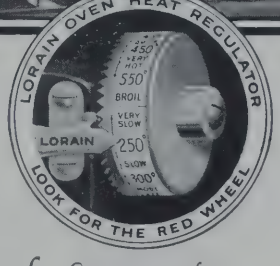
To the Men Who Plan and Build Apartment Buildings:

DO you know that a gas range equipped with the Lorain Oven Heat Regulator represents the highest achievement yet reached in the development of an appliance for the perfect cooking of foods?

Do you know that any kitchen Today that has a gas range *without* a Lorain Self-Regulating Oven cannot be said to have the *most modern* cookery equipment?

Do you know that in thousands upon thousands of homes and apartments, and in hundreds of churches, hospitals, fraternal organization structures and other types of high-grade buildings, gas ranges equipped with Lorain are regarded as *ideal cookery appliances?*

Apartment buildings at 6737-41-43 Paxton Avenue, Chicago. S. M. Seaton and Wm. H. Lautz, Architects, Chicago. Kitchens equipped with Clark Jewel Gas Ranges with Lorain Oven Heat Regulators.



One easy turn of the Lorain Red Wheel gives you a choice of 44 measured and controlled oven heats for any kind of oven cooking or baking.

Representative kitchen of these apartments, showing type of Clark Jewel Gas Range with Lorain Oven Heat Regulator. This particular kitchen is located at 6741 Paxton Avenue; Wm. H. Lautz, Architect.

Today, American housewives in general look upon a Lorain-equipped Stove as a real home necessity because it produces ideal results in Cookery by the modern Time and Temperature Method. The housewives that use this wonderful Lorain Self-Regulating Oven never experience an "unlucky" baking-day, for everything cooked or baked in the oven turns out *uniformly perfect, every time.*

They know that Lorain makes it possible to cook a Whole Meal in the oven *at one time* without any attention on their part—in fact, *they can be miles away while the meal is cooking,* and return hours later to find it deliciously done and ready to be placed on the table.

They also know that Lorain enables them to do their Canning in the oven, better, quicker and easier than by any other process.

Lorain-equipped Gas Ranges are used in over 1100 leading schools and universities for teaching the Science of Cookery. They are used in the research and experimental kitchens of dozens of manufacturers of nationally-known food products.

Catalogs and data of special interest to architects gladly sent upon request. For specific information see 19th Edition Sweet's Architectural Catalog.

These famous gas stoves are equipped with the Lorain Oven Heat Regulator: Reliable, Clark Jewel, Dangler, Direct Action, New Process and Quick Meal.

AMERICAN STOVE COMPANY, 444 Chouteau Avenue, St. Louis, Mo.

Largest Makers of Gas Ranges in the World

LORAIN OVEN HEAT REGULATOR

Double Protection Against Accident Where Needed

ASH removal must be accident proof. The greatest invitation to accidents is an open hoistway. G&G ash removal equipment insures *complete* protection to the hoistway.

Where the sidewalk opening is away from the side of the building, thus creating an opening on the fourth side of the hoist usually closed by the building wall, an *extra* set of G&G Spring Guard Gates can be provided, as is shown in the illustration.

It is the safety feature, plus the dependable and economical advantages of G&G ash removal equipment, that makes it so desirable to remove ashes the G&G way.

May we send you a new catalog illustrating various models so you may get a better conception of the reasons why so many buildings of all types use G&G equipment?

GILLIS & GEOGHEGAN
544 West Broadway **New York**

The G&G
REG. U.S. PAT. OFF.
Telescopic Hoist
with Automatic Gear Shifting Brake Device and Silencer

When It's Time To Write The Kitchen Specifications

CONSIDER the Autosan. Its compactness will fit in well with your plans. Its ability to cut china breakage 60%; labor costs 50%; and its economy in water, power and repair costs are due to special features such as the patented cushioned conveyor, eliminating the old-fashioned use of baskets.

The Autosan is made of copper, brass and bronze—by Colt's—your guarantee of superior workmanship. For that new Hotel, Hospital, Restaurant or Institution, consider the Autosan. An interesting folder describing Autosan advantages will be sent you on request.

Colt's Patent Fire Arms Mfg. Co.
Hartford, Conn., U. S. A. B-104

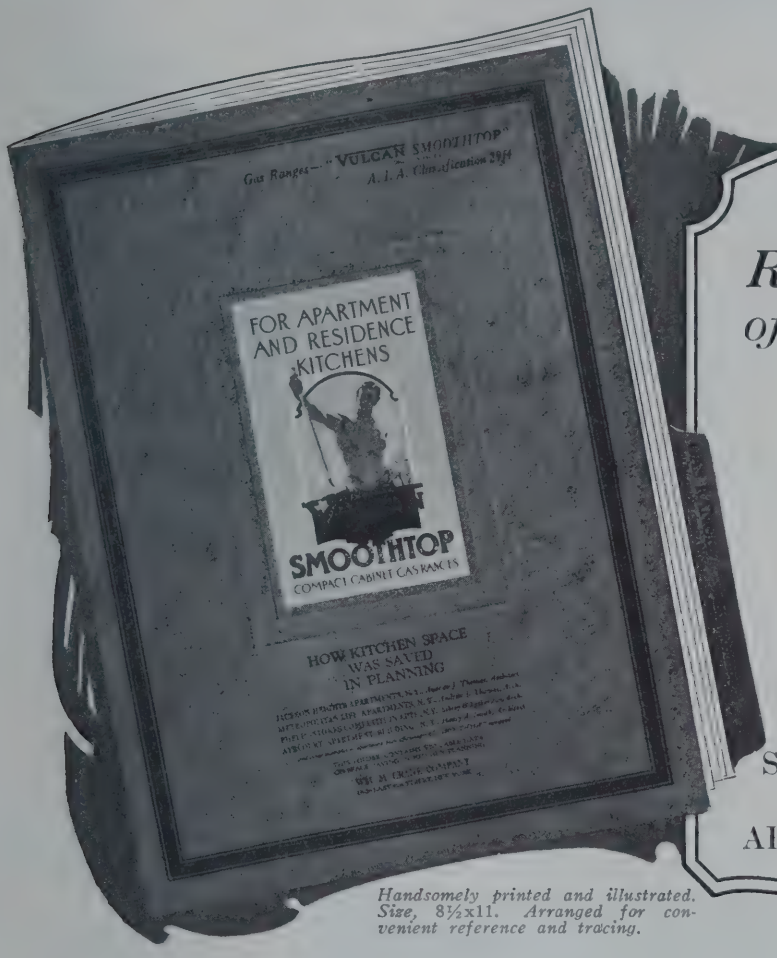
AUTOSAN
TRADE MARK REGISTERED U.S. PAT. OFFICE
DISH AND SILVER CLEANING MACHINE

OTIS

For more than a half century
The World's Word
For Elevator Safety

OTIS ELEVATOR COMPANY
Offices in all principal cities of the world

How To Save Space When Planning Kitchens For Apartment Buildings And Residences



Handsomely printed and illustrated. Size, 8½x11. Arranged for convenient reference and tracing.

A Practical Reference Booklet of Plans and Facts

—Based on the Experience of Leading Architects —Especially Planned and Written for Architects by an Authority in the

SERVICE DEPARTMENT
OF
ARCHITECTURAL FORUM

A Few Outstanding Features

1. Explains and illustrates kitchen plans, well-known operations, designed by noted architects.
2. Gives reduced scale drawings ready for immediate tracing.
3. Affords 8 complete Plan and Specification Data sheets.
4. Permits shifting the range on a plan to find best location.
5. Makes possible maximum economy in space with maximum convenience for housewives and cooks.

The only and original **SMOOTHTOP** built on Scientific lines and covered by Patents, U.S.,Canadian and British.

As many architects have learned by experience, and others are discovering every day, "an efficient kitchen is planned around the gas range." The kitchen is the "engine room" of the home, where the average woman spends at least 76 per cent. of her waking hours.

This Vulcan service booklet will enable you to give exceptional service to landlord, builder and tenant—with less work spent in your office and drafting rooms.

It is free to architects and builders only. Kindly ask for it on your *letterhead.* We'll gladly send it, promptly.

STANDARD GAS EQUIPMENT CORPORATION
Vulcan Division—Successor to
Wm. M. Crane Co., 18-20 E. 41st St., New York

MAKERS OF

Smoothtop
REG. U.S. PAT. OFF.
Gas Ranges

Satisfactory to both client and architect

An important part of our work is the fashioning of special lamps and standards from the architect's drawings with such careful holding to specifications and estimate that the finished product is invariably approved by both architect and client.

The Smyser-Royer Catalog "H" is a valuable reference on exterior Lighting Fixtures. It is sent to recognized architects on request.

LAMP POSTS—LANTERNS—BRACKETS

SMYSER-ROYER

Main Office and Works—York, Pa.
Philadelphia Office, 1609 Sansom St.

Portion of office screen, Hotel Statler, Buffalo, N.Y.

In Case You Have Not Thought of Frink Lighting In Connection With Hotels

STATLER knows what his guests want and he knows what his staff wants to enable them to give his guests what they want.

Imagine for instance, a Greeter welcoming a guest with the stabbing light from some exposed lighting fixture shining in his eyes.

To avoid that, Frink reflectors, concealed in the moulding of the office screen, are used.

They also give perfect light without chance of eye strain to clerks at work within.

Then, to avoid confusion and embarrassment to guests, Polar alite directional signs are freely used. These are but two of the instances where Frink can be of service to hotels.

Of the others, such as cove and novel dining room lighting one of our engineers would be glad to tell you. Write us today.

I.P. FRINK, Inc.

24th Street and 10th Ave., New York

Representatives in Principal Cities

A Thing of Beauty Is a Joy Forever:

—Keats

IN this splendid age where nothing of wealth is too great to be expended in the erection of magnificent and luxurious buildings for every branch of commerce:

Where offices, banks, cathedrals, art galleries, and schools are being built all over the land with lavishness and progressive development, architects of note specify lighting equipment by Guth.

They have long since learned that Beauty in distinctive designs, without overlooking the importance of correct illumination, is the ideal of every member of the Guth organization.

Our engineering and designing departments with their combined skill and ingenuity are ever at your disposal for the solution of your problems. We welcome your request for assistance. No obligation of course.

The EDWIN F. GUTH COMPANY

DESIGNERS - ENGINEERS - MANUFACTURERS

Lighting Equipment

ST. LOUIS U. S. A.

Formerly the St. Louis Brass Mfg. Co., and the Brascolite Company

BRANCH OFFICES (*Sales and Service*) IN PRINCIPAL CITIES

H489

THE ULTIMATE
In Architectural Illumination

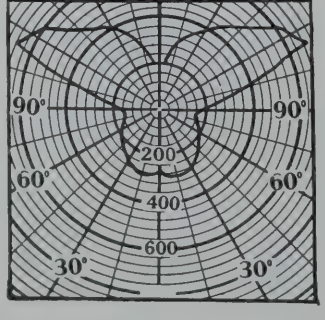
AS announced in last month's issue of the Architectural Forum, Holophane—the world's most efficient lighting product—is now available in beautiful period fixtures, the work of master craftsmen in metal.

¶ These new luminaires cover a wide range of lighting requirements—for banks, churches, hotels, schools, offices, stores and other types of buildings.

¶ Two of the many designs are here illustrated.

¶ A portfolio of sketches showing some 20 other fixtures is now being prepared for architects' libraries. The edition is limited; but if you will write us on your business letterhead we shall send you a copy, without obligation, as soon as ready.

HOLOPHANE GLASS COMPANY
Canadian Pacific Building, New York City
Works: Newark, Ohio
Paris Toronto London

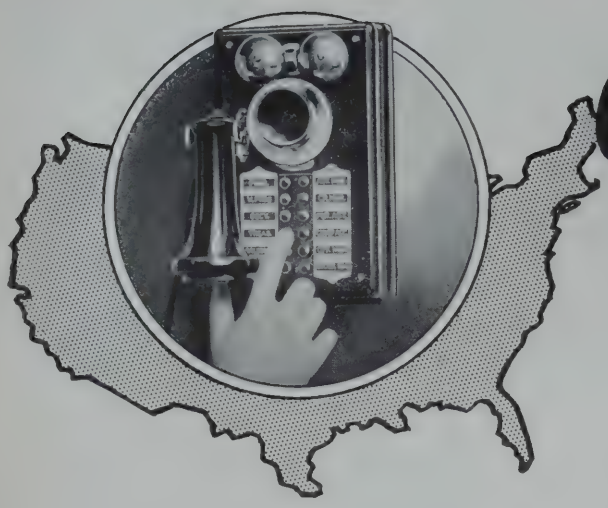


THE STANDARD R-r
(Holophane Reflector-Refractor)

This is one of the many Holophane units developed in scientific prismatic glass construction, which controls the light accurately. Also shown is the characteristic light distribution curve of the Holophane R-r. Adaptations of this unit are illustrated on the right hand page.

THE ADAPTATIONS
(Based on R-r Unit)

With Holophane R-r (Reflector Refractor) as the core and carefully detailed designs as a guide, skilled craftsmen work in metal beautiful period fixtures such as the above.



All over the U.S. Inter-Phones are on the job

Some more well-known users of Inter-Phones

F. W. Woolworth Co., Oklahoma City, Okla.
State Industrial School, Golden, Colo.
Southern Power Co., Charlotte, N. C.
General Electric Co., Morton and Greenwich Sts., New York City
Equitable Trust Co., 220 Broadway, New York City
New York State Gas & Electric Co., Oneonta, N. Y.
Better Sox Knitting Co., Fort Atkinson, Wis.
Milwaukee County Agricultural School, Wanwatosa, Wis.
Kidder-Peabody Co., Boston, Mass.
Salem High School, Salem, Oregon
American Railway Express Co., San Francisco, Cal.
Duluth National Bank, Duluth, Minn.
Utah Light & Traction Co., Salt Lake City, Utah

Western Electric
INTER-PHONE SYSTEMS

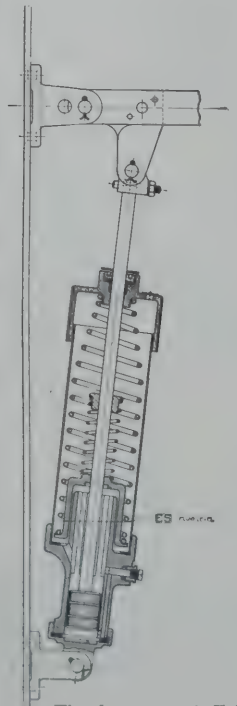
furnish a means for quick intercommunication, night or day, without the intermediary of a switchboard.

Whether for a building in plan stage or one already occupied, a Western Electric system can be quickly provided. Let us send you a copy of our Architects' Bulletin on Inter-Phones.

Write our nearest Distributing House or the Western Electric Co., 100 East 42nd St., New York City.

Western Electric
OFFICES IN FORTY-NINE PRINCIPAL CITIES

ES



The Improved E-S closer.
Easier opening.
Quicker closing.
Stronger construction.

Improving a Product Already Perfect

FROM over fifty thousand of our door closers in daily use, all over the country, we have never had a serious complaint. For all practical purposes, the ES door closer is a perfect piece of mechanism.

Yet our research department has found a way to *improve* them. This without cost to you.

A change in the spring construction makes the opening easier and closing faster. The bearing surface at both ends of the improved ES closer has been made larger by over 200%; thus stronger. A malleable iron base at the bottom replaces one of cast iron and a steel yoke on top of the piston rod makes it still stronger.

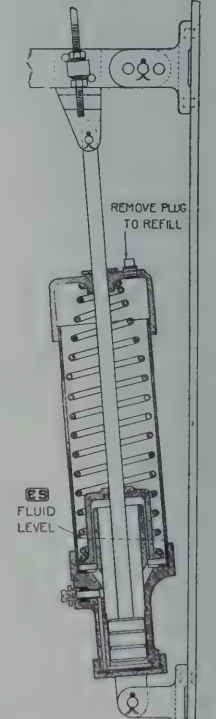
Write us today for full particulars.

ELEVATOR SUPPLIES COMPANY, Inc.
Main Office and Works
HOBOKEN, N. J.

Main Office and Works
1515 WILLOW AVENUE, HOBOKEN, N. J.

BRANCH OFFICES

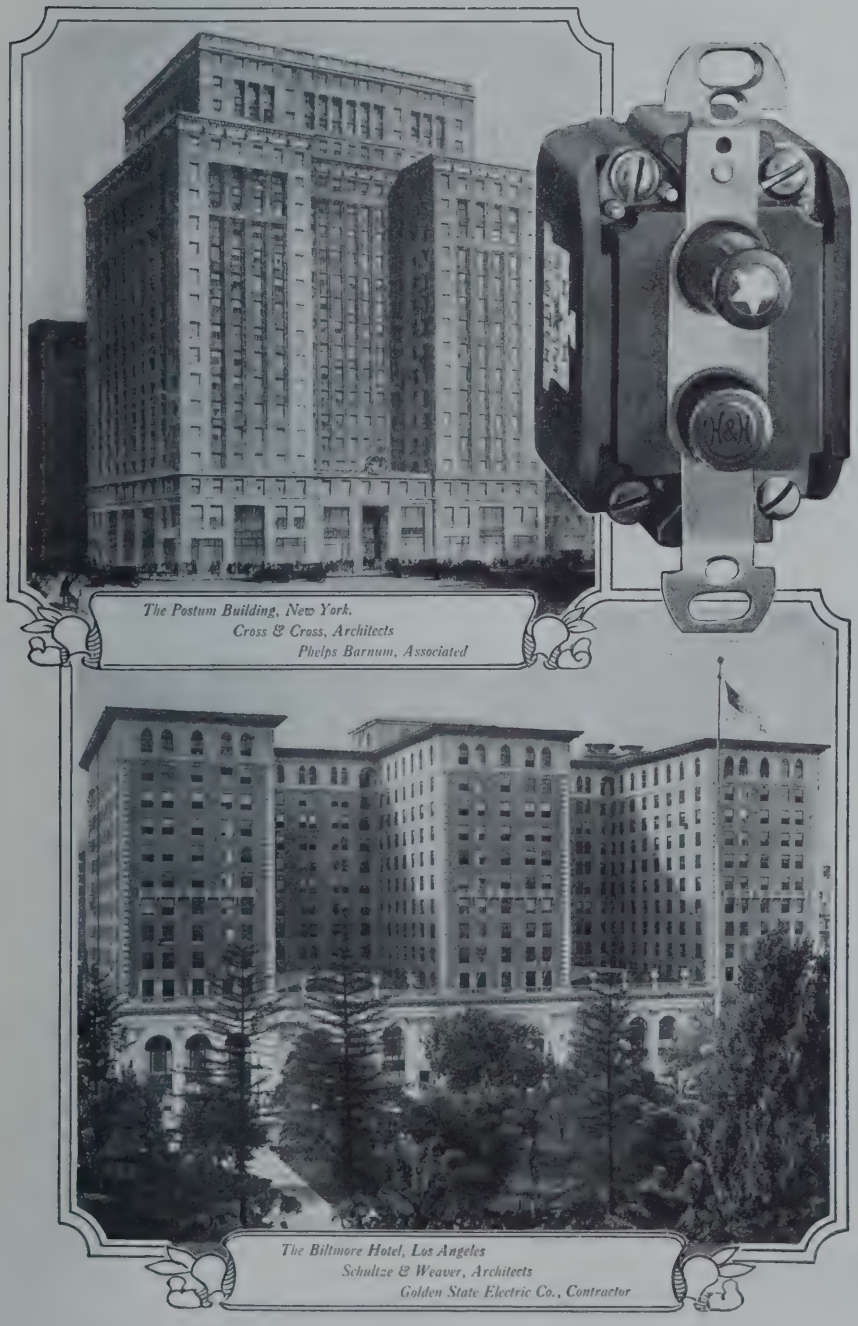
Cleveland, 1030 Walnut Ave.
Chicago, 111 South Jefferson St.
St. Louis, Leather Trades Building
San Francisco, 186 Fifth St.
Philadelphia, 1714 Ludlow St.
Los Angeles, 1120 S. Hope St.
Dallas, Texas, 424 S. Akard St.



There are less moving parts in E-S Closers than any other type. They can also be refilled without removing.

The GOLD STAR *Switch at Home*

ARCHITECTS of buildings like these, create the right environment for the GOLD STAR Switch. Without thought of switches, you assemble the elements of Quality. You work out a harmony of design, appointments and fixtures. Your plan carries through the interior detail *to* the wiring devices. And before you take risks with the fitness of things, you have specified "Gold Star" Switches.



The Postum Building, New York.
Cross & Cross, Architects
Phelps Barnum, Associated

The Biltmore Hotel, Los Angeles
Schultze & Weaver, Architects
Golden State Electric Co., Contractor

Your "Gold Star" Jobs

On east coast and west are famous structures—the homes of Gold Star switches. For architects, all, have their "*gold star*" jobs, where beauty, service, and permanence should show in the switches. Of all the *de luxe* touches in a room, what so *tangible* as the owner's touch on the push-button of a Gold Star switch! There, for sure, is fine construction *felt.*

The Architect's Handbook

Your handiest reference to the Gold Star switch and data for specifying, is "The Architect's Handbook of H&H Wiring Devices." Besides data, the "Handbook" presents many fine buildings where H&H Switches support fine architecture. Not all of them Gold Star switches, but all good switches that grace the job whatever the class of requirements.

Give us the pleasure of giving you the "Handbook," by telling us how to address it.

THE HART & HEGEMAN MFG. CO. HARTFORD, CONN.

A Few Banner Finish Jobs---

1. New Capital Hotel, Frankfort, Ky.
2. Fraternity Club Building, New York City
3. Reakirt Bldg., Cincinnati, Ohio
4. Urbana-Lincoln Hotel, Urbana, Ill.
5. Office Building, Maiden Lane & William St., New York City
6. Third Church of Christ, Scientist, New York City
7. Edgewater Beach Hotel, Chicago, Ill.
8. New Empire Hotel, New York City
9. New Jersey State Normal School, Glassboro, N. J.
10. Cambridge Trust Co., Chester, Pa.
11. Public School, Germantown & Southampton Aves., Philadelphia, Pa.
12. Mellon National Bank, Pittsburgh, Pa.

The End of a Perfect Year

¶ It's nothing more than a little problem in arithmetic to measure a year by hours, by days, or by months.

¶ By simple addition you merely arrive at a collection of numerals.

¶ But when you measure that year by the things you have done in the hours or days or months it gave you, there is found an answer that serves to point out your shortcomings or to spur you on to greater success.

¶ By the latter method, we find that 1924 is the end of a perfect year for Banner Finish.

¶ Hundreds of testimonials from plasterers tell us that Banner is made as they want it.

¶ Contractors point to a saving in time and material on every Banner Finish Job.

¶ And, by specifying Banner in countless structures of all types and sizes throughout the country, leading American architects proved our claim that a finishing lime must not only make the plasterer's work easier and cut costs for the contractor but prove, under most rigid tests, that it will stay put.

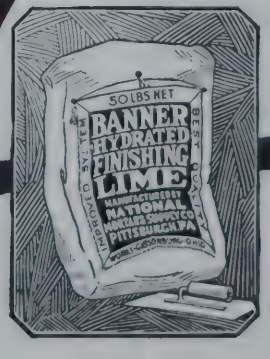
¶ It is the aim of Banner Finish to maintain this record during 1925.

National Mortar & Supply Company

Federal Reserve Building

Pittsburgh, Pa.

Banner



"Easy to spread--
hard to beat"

Tough Elastic Enamel

SHAVE it off—yes. But chip, peel or rub it off—never! The coating is what counts and ***Economy*** Rigid Conduit Coating is tough, elastic, adhesive enamel—baked on!

Made from the same high grade Spellerized tubing as the famous Sherarduct, this favorite Black Enameled Conduit means ***Economy*** in fact as well as in name.

Economy threads are clean threads—cleaned before shipment. No rethreading ever necessary

National Products

NATIONAL RIGID CONDUIT
For high grade wiring

SHERARDUCT
Protected by both zinc and enamel

ECONOMY
Protected by enamel only

FLEXSTEEL ARMORED CABLE and CONDUIT
For high class work at minimum cost

FLEXTUBE NON-METALLIC CONDUIT
For knob and tube wiring and the like

NATIONAL METAL MOLDING and FITTINGS
For circuit extensions and surface wiring

NATIONAL INSULATING BRACKETS
For service entrances and similar uses

NATIONAL CONDUIT and CABLE FITTINGS
Locknuts—Bushings—Box connectors and other items

NATIONAL OUTLET BOXES
a box or cover for every need

LIBERTY WIRES, CABLES and CORDS
For 600 volts or less

LIBERTY AUTOMOBILE WIRE
AUTO-STEELFLEX METAL CONDUIT
For the electrical circuits of motor vehicles

NATIONAL CARBURETER, HEATER and EXHAUST TUBING
For motor vehicles

National Metal Molding Company

WORLD'S LARGEST PRODUCERS OF ELECTRICAL CONDUITS AND FITTINGS

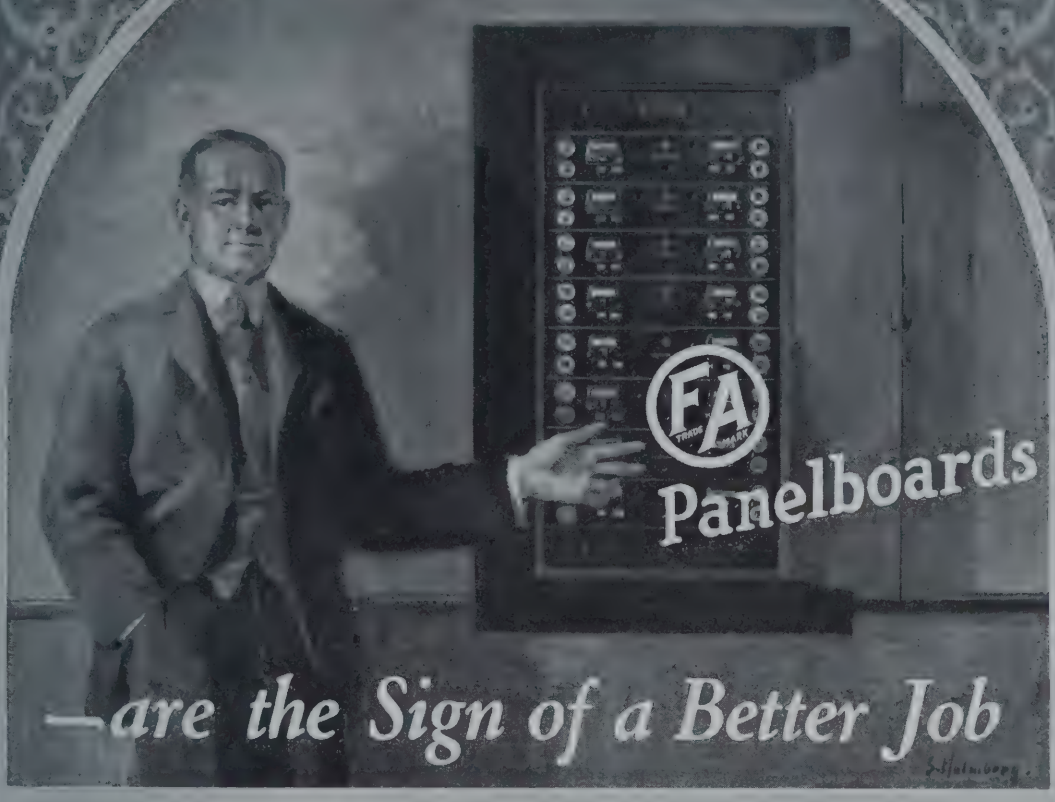
1236 Fulton Building, Pittsburgh, Pa.

Represented in All Principal Cities 15

ECONOMY

A NATIONAL METAL MOLDING PRODUCT

Black Enameled Rigid Conduit



—are the Sign of a Better Job

SPECIFYING ⒻⒶ Panelboards expresses experienced judgment, for they serve better than others at lower cost. Furthermore, they are an index to the quality of the entire wiring job.

Your own reaction in seeing ⒻⒶ Panelboards in a new building is that of all architects, contractors and most owners—ⒻⒶ ***Panelboards are the sign of a better wiring job.***

ⒻⒶ Safety Type Panelboards are made up of standardized sections, each panelboard shipped completely assembled, certain of fitting an ⒻⒶ Standardized Steel Cabinet. Plug and Cartridge Fuse Types, with or without controlled branches.

Complete catalog, estimates and any service data desired gladly furnished without obligation.

Frank Adam
ELECTRIC COMPANY
ST. LOUIS

Detroit Cincinnati New Orleans Denver Minneapolis Philadelpia Kansas City New York Los Angeles San Francisco Winnipeg, Canada Indianapolis Pittsburgh Chicago Dallas

Atmosphere

The old door-way, the arch, the balcony, the wrought-iron lantern—all make atmosphere.

The modern church, the office building, or the theatre, gain atmosphere by careful designs and an exacting selection of appointments.

Serenity in the church; efficiency in the office; awe and wonder in the theatre—that is the kind of atmosphere CURTIS LIGHTING with X-Ray Reflectors lends.

Curtis Lighting is mobile—it is versatile. The designs are excellent. Workmanship beyond question.

Curtis Lighting engineers are trained to understand—atmosphere.

CURTIS LIGHTING, INC.

A Grouping of
National X-Ray Reflector Co.
X-Ray Reflector Co. of N. Y., Inc.
Luminaire Studios, Inc.

1116 West Jackson Boulevard
CHICAGO

31 W. Forty-Sixth St. New York
Merchants Nat. Bank Bldg. Los Angeles

X-Ray REFLECTORS

Kewaunee
LABORATORY FURNITURE

A Book For Architects

THE new Kewaunee Book—416 pages, lavishly illustrated—many pages in colors—will interest and benefit any Architect who is engaged upon a School, Hospital or Manufacturing Plant.

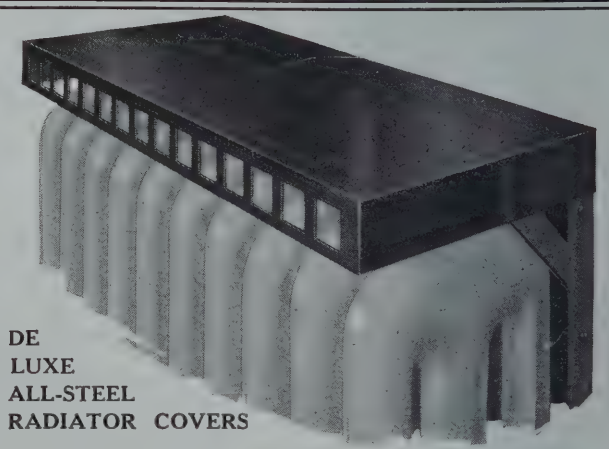
Our line contains over 500 standard designs of Laboratory Desks and other Furniture, any of which we are in a position to ship immediately. We also manufacture special equipment to order.

Ask for a copy of the Kewaunee Book.

Address All Inquiries to the Factory at Kewaunee

Kewaunee Mfg. Co.
LABORATORY FURNITURE EXPERTS

C. G. CAMPBELL, Treas. and Gen. Mgr.
New York Office
70 Fifth Avenue
141 Lincoln Street
Kewaunee, Wis.
Offices in Principal Cities



DE LUXE ALL-STEEL RADIATOR COVERS

SAVE THE COST OF REDECORATING

De Luxe All-Steel Covers fit either steam or hot water radiators. They deflect the upward current of air and distribute the heat evenly out into the room. Walls and draperies above the radiators are protected from the air currents and do not become discolored and dirty.

Furnished in beautifully grained wood finishes, or in flat tones, to match sample; offer the interior decorator an opportunity to bring radiators into harmony with the decorating scheme.

JUST FILL OUT THIS COUPON

FRANK S. BETZ CO., Hammond, Indiana. Dept. AF.
Please forward me without obligation, illustrated folders on De Luxe All-Steel Radiator Covers.

Name.....
Street.....
City..... *State*.....
Business.....

Mary Imogene Bassett Memorial Hospital, Cooperstown, N. Y.
F. P. Whiting, New York City, Architect and Consulting Engineer.

Panelboards to meet every Requirement

Recognizing the diversity of both the architectural and the electrical requirements of modern building structures, the aim of the General Electric Company has been to design panelboards flexibly adapted to meet any reasonable requirements which are presented.

In the G-E panelboards are combined the result of extensive research, wide experience, careful selection of materials, modern manufacturing methods and accurate assembly.

Compact in form, neat in appearance, conservative in rating, G-E panelboards combine the ultimate in effective control of electric circuits with maximum safety for the operator. They are designed and built to fulfill the requirements of the Electric Safety and National Electric Codes.

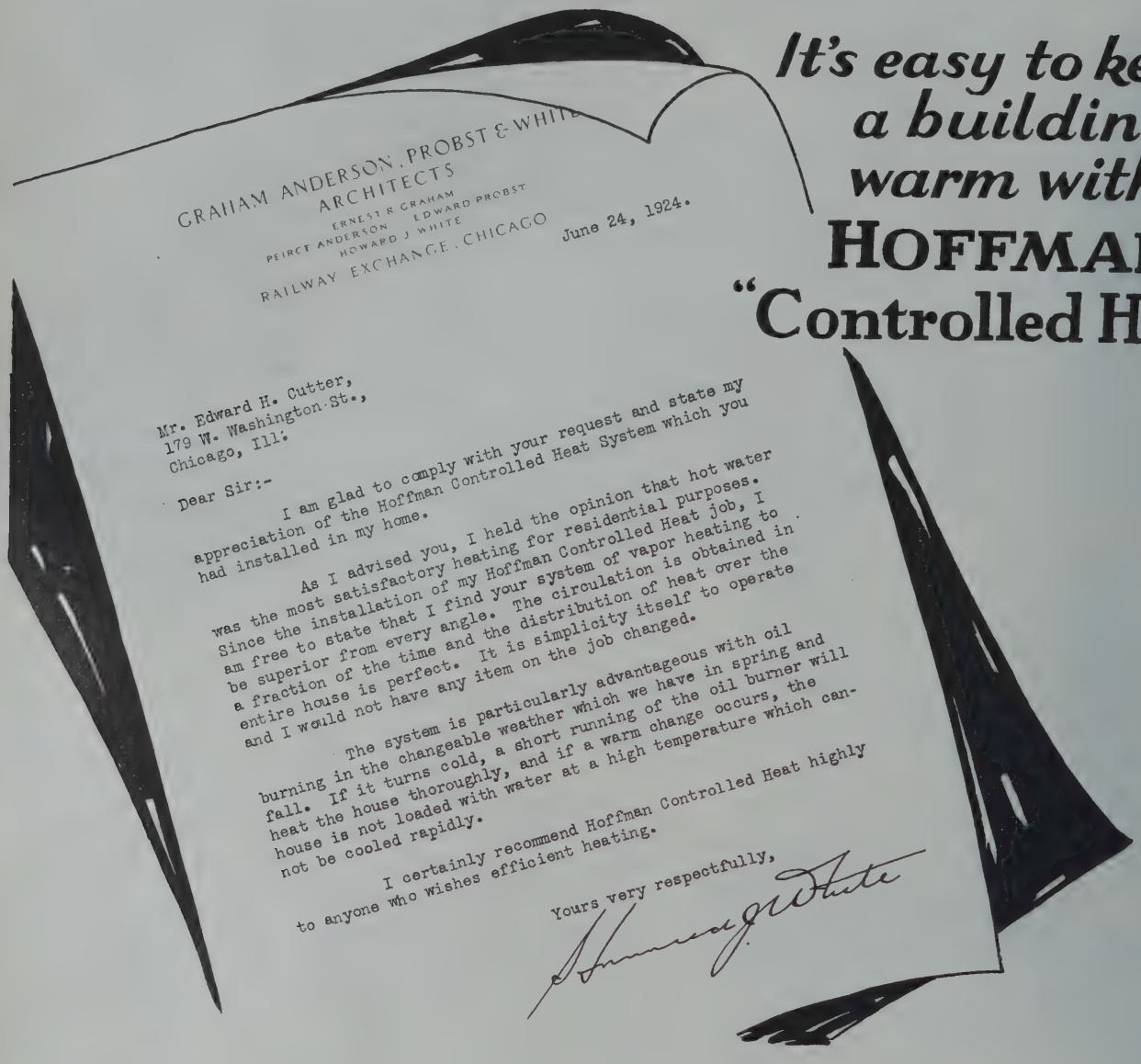
Reference Descriptive sheet 67900-A

54C-104

GENERAL ELECTRIC

GENERAL ELECTRIC COMPANY, SCHENECTADY, N. Y., SALES OFFICES IN ALL LARGE CITIES

It's easy to keep a building warm with HOFFMAN "Controlled Heat"



GRAHAM ANDERSON, PROBST & WHITE
ARCHITECTS
ERNEST R GRAHAM
PEIRCE ANDERSON EDWARD PROBST
HOWARD J WHITE
RAILWAY EXCHANGE, CHICAGO

June 24, 1924.

Mr. Edward H. Cutter,
179 W. Washington St.,
Chicago, Ill.

Dear Sir:-

I am glad to comply with your request and state my appreciation of the Hoffman Controlled Heat System which you had installed in my home.

As I advised you, I held the opinion that hot water was the most satisfactory heating for residential purposes. Since the installation of my Hoffman Controlled Heat job, I am free to state that I find your system of vapor heating to be superior from every angle. The circulation is obtained in a fraction of the time and the distribution of heat over the entire house is perfect. It is simplicity itself to operate and I would not have any item on the job changed.

The system is particularly advantageous with oil burning in the changeable weather which we have in spring and fall. If it turns cold, a short running of the oil burner will heat the house thoroughly, and if a warm change occurs, the house is not loaded with water at a high temperature which can not be cooled rapidly.

I certainly recommend Hoffman Controlled Heat highly to anyone who wishes efficient heating.

Yours very respectfully,

Howard J White

WHETHER for an office building, hotel, church or home, Hoffman "Controlled Heat" is equally effective. It meets the strictest requirements of a heating system.

Hoffman "Controlled Heat" insures heat comfort on the coldest days, and yet is adaptable to outside weather changes. The temperature of each room can be regulated easily and accurately by the Hoffman Modulating Valve.

The Hoffman "Differential Loop," with no moving parts, absolutely prevents a burned out boiler—compared with mechanical appliances for the same purpose it is extremely simple.

Hoffman Modulating and Return Line Valves, with the other required specialties, make "Controlled Heat" one of the greatest forward steps in heating science. It is economical and reliable. It is flexible and silent. There is nothing more that can be demanded of a heating system.

A vast amount of valuable information on heating problems is to be found in the Hoffman "Data Book." We shall be pleased to send you a copy on request.

HOFFMAN SPECIALTY COMPANY, INC

Dept. C, 512 Fifth Avenue, New York, N. Y.

HOFFMAN CONTROLLED HEAT

Stronger—Cheaper—Firesafe

Reinforced Stucco is as strong as Gibraltar and as durable as the Pyramids — because this man-made stone is stronger and more durable, thickness for thickness, than nature's stone.

Reinforced Stucco can be quickly and economically fashioned into designs and shapes which, in sheer beauty and architectural effect, rival sculptured stone or marble.

But the outstanding advantage of *Reinforced Stucco* is ECONOMY. *Reinforced Stucco* costs very little, if any, more than even standard wooden frame construction: *Reinforced Stucco* requires no maintenance, whereas the cost of painting a frame building amounts to as much, if not more, in 40 years, than the entire original cost of the building.

Even as primitive man practiced the principle of reinforcement by embedding *reinforcing twigs* in the clay of which he built his home—

So we, today, embed infinitely stronger *reinforcing wires* (or fabric) in Stucco, in order to make it stronger and permanently weather-tight — in order to "bind" the Stucco together, and to the building, and thereby prevent cracking and falling.

Before you build or remodel, write for a copy of our free book—
"Building a Permanent Home"

NATIONAL STEEL FABRIC COMPANY
(SUBSIDIARY OF PITTSBURGH STEEL CO.)
710 Union Trust Building, Pittsburgh, Pa.

OFFICES: Atlanta Cincinnati Chicago Cleveland Dallas Denver Detroit Houston Los Angeles New York City Philadelphia Pittsburgh Rochester St. Louis San Antonio San Francisco.
STOCKS: Chicago Houston Los Angeles New York Pittsburgh San Francisco.

P214 STEEL FABRIC is a base and reinforcement for stucco and plaster — it combines 6 building materials into 1; namely, sheathing, building paper, lath, "furring," reinforcement and nails.

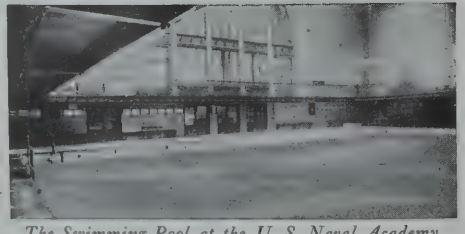
It is applied either direct to studs or over sheathing or insulation.

When You Build REMEMBER these Things

REINFORCED STUCCO HAS ALL OF THESE CHARACTERISTICS INDIVIDUALLY AND AS A WHOLE

THE ONLY SAFE WATER IS A STERILIZED WATER

SWIMMING POOL SANITATION



The Swimming Pool at the U. S. Naval Academy, Annapolis, Md., where W & T Apparatus is Protecting the Health of the Bathers

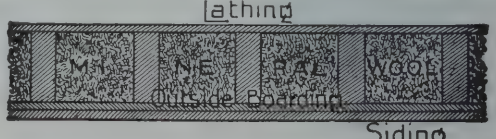
The W & T Process of Chlorination, used by over 200 Pools, is the least expensive and most efficient method of Swimming Pool Sterilization.

A sterilized water cannot cause disease.

Technical Publication No. 21, containing full data and specifications will be mailed on request

WALLACE & TIERNAN
COMPANY INCORPORATED
NEWARK : NEW JERSEY

NEW YORK CHICAGO PITTSBURG SAN FRANCISCO KANSAS CITY
ST. LOUIS SEATTLE KNOXVILLE DALLAS MINNEAPOLIS
WALLACE & TIERNAN, LTD., TORONTO



Section of Outside Wall of House, Showing Wool Between Studding

Mineral Wool for Building

Mineral Wool has superseded all other materials used for similar building purposes because it does "a great work at little expense." A house lined with Mineral Wool has an indestructible, fire-proof and vermin-proof guard; it protects the entire household. In the winter time it keeps the cold air out, facilitating proper heating and economy in fuel. In the summer it keeps the heat out.

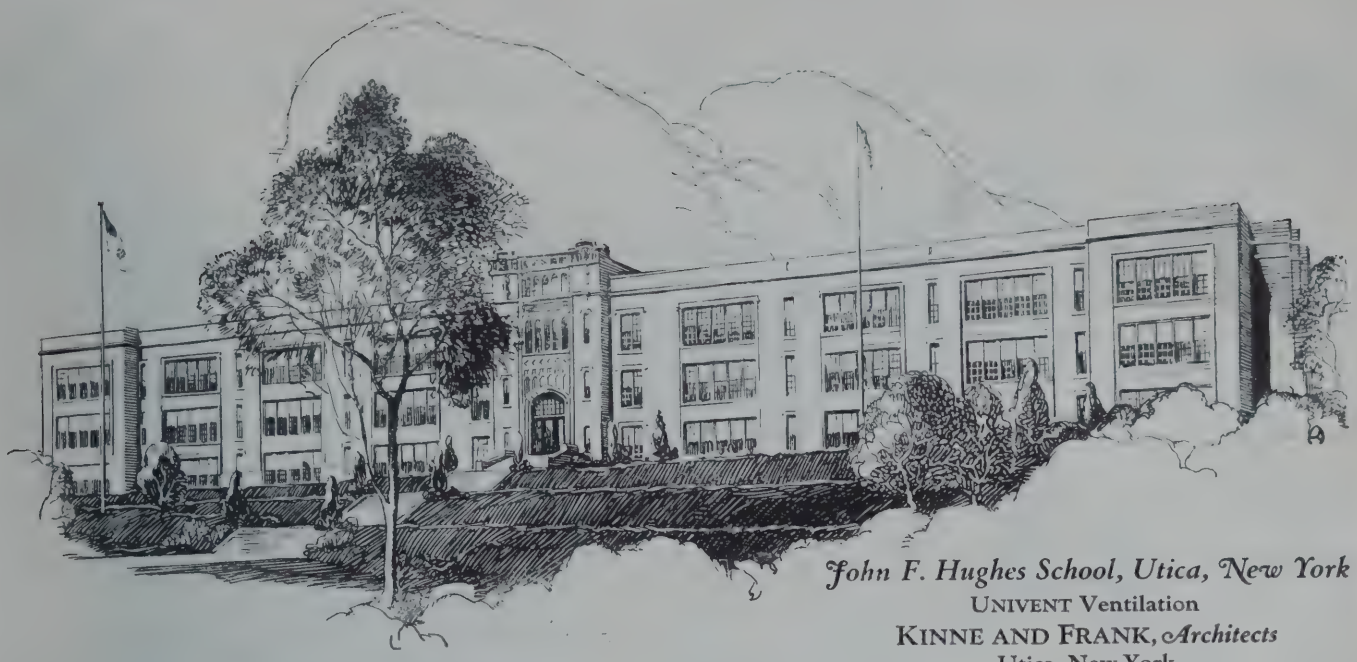
This material, being of fibrous, inelastic composition, acts as a deadener and muffles all sound. It is considered the best insulator material on the market, making it a perfect refrigerating machine.

Mineral Wool makes life-long friends of all its users. If you are skeptical as to its power, let us demonstrate. We can prove all claims. Write us today.

U. S. MINERAL WOOL CO.

280 Madison Avenue, New York

Section of Sound-Proof and Fire-Proof Partition



John F. Hughes School, Utica, New York
UNIVENT Ventilation
KINNE AND FRANK, *Architects*
Utica, New York

There's no substitute for Health

It's more precious than a King's ransom. Good health and keen minds depend upon the air we breathe.

That's why Architects and Educators everywhere are properly ventilating their schools with Univent ventilation.

The Univent system brings the fresh out-door air directly into the classroom—cleans and warms it—and delivers it silently and without drafts to every part of the classroom.

Make school days happier with the

UNIVENT (TRADE MARK)

And now—an even greater UNIVENT

The trend of progress is toward simplicity. Years of experimental research has made possible the building of a Univent that occupies no more space than an ordinary radiator.

It is extremely simple in operation and accessible for cleaning and inspection.

The low temperature, high capacity, non-corrosive copper radiator has sufficient capacity to warm the incoming air from zero to 110 degrees. It will last a lifetime.

An efficient, cleanable filter for cleaning the air of dust and soot particles may be furnished when required.

A low speed fan and motor with a capacity for handling 81,000 cu. ft. of fresh air per hour, silently and economically, is another distinct Univent feature.

If you are interested in good ventilation send for the latest copy of Univent Ventilation. No obligation.

THE HERMAN NELSON CORPORATION *Moline, Ill.*

1948 Third Avenue

Branch Sales and Service Stations

BELFAST, ME.					
BOSTON	PHILADELPHIA	CLEVELAND	MILWAUKEE	EMPORIA	SALT LAKE CITY
NEW YORK CITY	SCRANTON	COLUMBUS	MINNEAPOLIS	OMAHA	SPOKANE
BUFFALO	PITTSBURG	TOLEDO	CHICAGO	KANSAS CITY	PORTLAND
ROCHESTER	GRAND RAPIDS	DES MOINES	ST. LOUIS	DENVER	SEATTLE

The Fifth Avenue Hospital, being modern in every respect, uses the Kny-Scheerer Operating Room Light as well as other Kny-Scheerer equipment.

To Meet the Demands of Modern Surgery

Constant, unfailing service — perfect performance — these must be accomplished by every piece of equipment — especially in the Operating Room.

The Kny-Scheerer Operating Room Light gives uninterrupted service under all conditions. The supplementary gas light is a positive protection against any interruption when fuses blow out or the electrical current is shut off. The safety of the patient, the reputation of the surgeon and the hospital, require this double protection. With a combination of electricity and of gas a near daylight is produced — shadowless, strong and steady. Delicate operations can best be performed under this illumination. Send for our descriptive literature, describing the Light in detail.

Electro-Medical Apparatus
First Aid Equipment
Hospital Furniture
Hospital and Surgical Sundries
—Enamelware
Glassware
Rubber Goods
Hydro-Therapeutic Apparatus
Instruments
—General Operating
Specialists
Surgical
Invalid Conveniences
Laboratory Equipment
Operating Room Equipment
Sanatorium Equipment
Scientific Apparatus
Sick Room Conveniences
Sterilizers
—Bed Pan
Dressing
Instrument
Utensil
Water
X-Ray Apparatus and Equipment

Architects interested in hospital planning may have valuable assistance from the Engineering Service Department of the Kny-Scheerer Corporation without any obligation. During a quarter century of experience in equipping Hospitals, we have often assisted the Architect in his desire to effect substantial economies in equipment and arrangement.

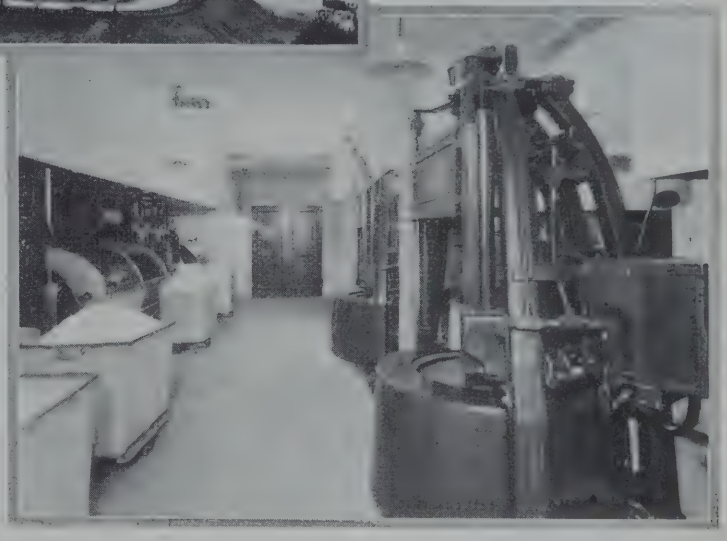
The KNY-SCHEERER Corp.
OF AMERICA

119 Seventh Avenue Dept. L. New York, N.Y.

No. 3 of a series of advertisements featuring prominent laundry installations

The Atlanta-Biltmore, Atlanta, Georgia. Schultze and Weaver, New York, Achitects.

A section of the washroom—equipped with Cascade washers and Humatic extractors.



—and at the new Atlanta-Biltmore

One of the outstanding events in the hotel world during 1924 was the opening of the new Atlanta-Biltmore Hotel in Atlanta, Georgia—the finest link in the Bowman chain of super-hotels. And of course the management included a completely "American" equipped laundry as a part of the "back-of-the-scenes" service. This Atlanta-Biltmore laundry is one of the finest equipped and most efficient hotel plants in the entire South.

The equipment will handle from 1,000 to 1,500 pieces of flat work per hour—and in addition there is an entirely separate department for laundering guests' apparel. Through this feature much of the laundry overhead is turned into profit.

A card will bring full details of the installations featured in this and other advertisements of this series.

A section of the ironing and finishing department.

At your service—a corps of laundry specialists

The American Laundry Machinery Company maintains a corps of engineers who have gained wide experience in planning and equipping most of this country's foremost hotel, commercial and institutional laundries.

If you have any questions pertaining to modern laundry practice you will find consultation with these specialists advantageous. This service is gladly offered you without any obligation whatever.

The American Laundry Machinery Company

Norwood Station Cincinnati, Ohio

THE CANADIAN LAUNDRY MACHINERY CO., Limited
47-93 Sterling Road, Toronto, Ont., Canada

Agents: BRITISH-AMERICAN LAUNDRY MACHINERY CO., Limited
36-38 Victoria St., London, S. W.-1, England

Sturtevant Stationary Suction Sweeping System installed in Copley Plaza Hotel, Boston, Mass.

In Old New England

Sturtevant Stationary Cleaner in Boston's Copley Plaza

Here, this installation is giving perfect satisfaction with practically no cost for maintenance.

Architects! Specify Sturtevant Stationary Suction Sweeping Systems for the buildings you are now planning.

By so doing you give your clients the most durable suction sweeping systems on the market today. And you have the assurance and guarantee of Sturtevant that the cleaner will meet with the entire satisfaction of your clients.

We say: "Our cleaner is superior to all others." Ask us to prove it.

B. F. STURTEVANT COMPANY

Plants Located in

Hyde Park, Mass. Framingham, Mass. Sturtevant, Wis.
Camden, N. J. Berkeley, Cal. Galt, Ontario

Sturtevant
PUTS AIR TO WORK

Sales engineering offices and direct representatives in every commercial center of the world

153

HESS CABINETS and MIRRORS

Snow-White Steel

Rapp & Rapp, Architects

In the Windemere—East

THE fine New Windemere-East Hotel, Chicago, is equipped with Hess snow-white steel cabinets. The artistic design, the beauty of the snow-white enamel, and the durability of the pressed steel construction are rapidly making the Hess the favorite medicine cabinet for high grade hotels, apartments, and office buildings.

See Sweet's Index; or write for illustrated "Cabinet and Mirror" catalogue.

HESS WARMING & VENTILATING CO.
Makers of Hess *Welded Steel* Furnaces
1216 S. Western Avenue, Chicago

Stewarts IRON FENCE

STANDARD OF THE WORLD

There is a distinctive Stewart design for the correct completion of any architectural plan, for town or suburban home, modest bungalow or country estate.

Book of Designs "C" sent upon request

We also manufacture grilles, balconies, partition railings, folding gates, miscellaneous iron and wire work and chain-link wire fence.

Architects' designs executed in strict accordance with their specifications

THE STEWART IRON WORKS COMPANY
INCORPORATED
CINCINNATI, OHIO, U.S.A.
"The World's Greatest Iron Fence Builders"

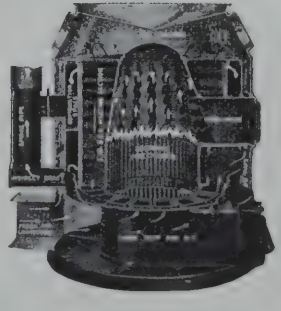
Interior in the residence of P. C. Chancellor Millbrook, N. Y. *Edward Smith, Architect Poughkeepsie, N. Y.*

Save the Window and Wall Space

Every woman objects to radiators because they interfere with her scheme of interior decoration. They always happen to be just where she would like to place a chair or table.

By using the Kelsey Warm Air Generator, you can give your client every advantage in the way of heating equipment, and yet conserve the wall space. The warm air may be brought in through registers in out-of-the-way places.

There are many other advantages in using the Kelsey Warm Air Generator, such as a continuous supply of fresh, warm air, with just enough moisture, supplied by the automatic humidifier, to make 70° feel like 72°. Kelsey fuel consumption is extremely low, the heater is the heaviest on the market and built for a lifetime of efficient service. It is totally unlike any other heater, and there are scientific reasons for its effective and economical performance.



Our Engineering Department offers the fullest cooperation to the architect, and will furnish detailed plans and specifications for each installation.

Write for "Kelsey Achievements," and keep it on file for reference. It contains valuable information.

Sales Offices
Boston and New York

THE KELSEY
WARM AIR GENERATOR
Trade Mark Reg. U. S. Pat. Off.
251 James Street, Syracuse, N. Y.

Dealers
Principal Cities

KELSEY HEALTH HEAT

A Monograph of the Work of Mellor, Meigs & Howe

With Preface by Owen Wister

AMERICAN architecture includes no domestic work more distinctive and full of character than that of these Philadelphia architects, and few designers are as able to bestow upon a building the appearance of spacious, informal dignity desired today and expressed in the work of this firm.

¶ Here there is presented in one volume a review of most of their best work. It includes large half-tone cuts from original photographs of residences, chiefly country or suburban, of other domestic buildings, farm structures, a few clubs, college or fraternity buildings, and a number of structures of other kinds. Most of these items are accompanied by plans and other drawings, sections, and details of interior trim. The materials used in these buildings are wood, stone, brick, stucco, and combinations of all these, and the structures illustrated are of many widely different architectural styles, each interpreted with that taste, skill and close attention to detail for which the firm is well known.

¶ Many of the items presented here include loggias, terraces, gardens and other out-of-door work which is developed with the care and thought which characterize the buildings themselves, and full plans of grounds and gardens accompany most of the illustrations. This is a volume which should be included in the working library of every architect and landscape architect.

212 pages; 12 x 16 inches; lavishly illustrated with half-tone plates of exteriors and interiors; printed on heavy coated paper, and bound in cloth.

Price $20

ROGERS AND MANSON COMPANY
383 Madison Avenue, New York

Aaron Burr's daughter

once owned this historic building, which is now the Claremont on Riverside Drive, one of America's famous road-houses.

Built before 1776, this building is wonderfully preserved today. Rust-resisting Toncan Metal is used for all sheet metal work as a safeguard against the ravages of time and the elements.

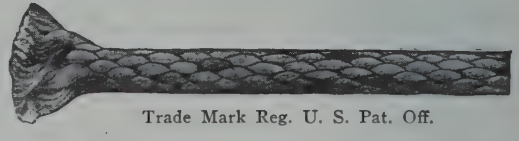
While Toncan surpasses all iron-base metals in rust and corrosion-resisting qualities, it costs but little more than common steel.

Write for full information on Toncan Metal.

UNITED ALLOY STEEL CORPORATION, Canton, Ohio
Branches in Principal Cities

TONCAN METAL
THIS IRON WILL ENDURE
UNITED ALLOY STEEL CORPORATION

Samson Spot Sash Cord



Trade Mark Reg. U. S. Pat. Off.

Made of extra quality stock, carefully inspected and guaranteed free from all imperfections of braid or finish.

Does not contain the loaded centre often found in common cord, which increases the weight and price per foot and greatly decreases the durability over pulleys

Samson Spot Cord can be distinguished at a glance by our trade mark, the Colored Spots, used only with this quality.

The difference in first cost between Spot Cord and the cheapest kind for a whole house is often less than the expense of replacing one broken cord.

Send for sample card

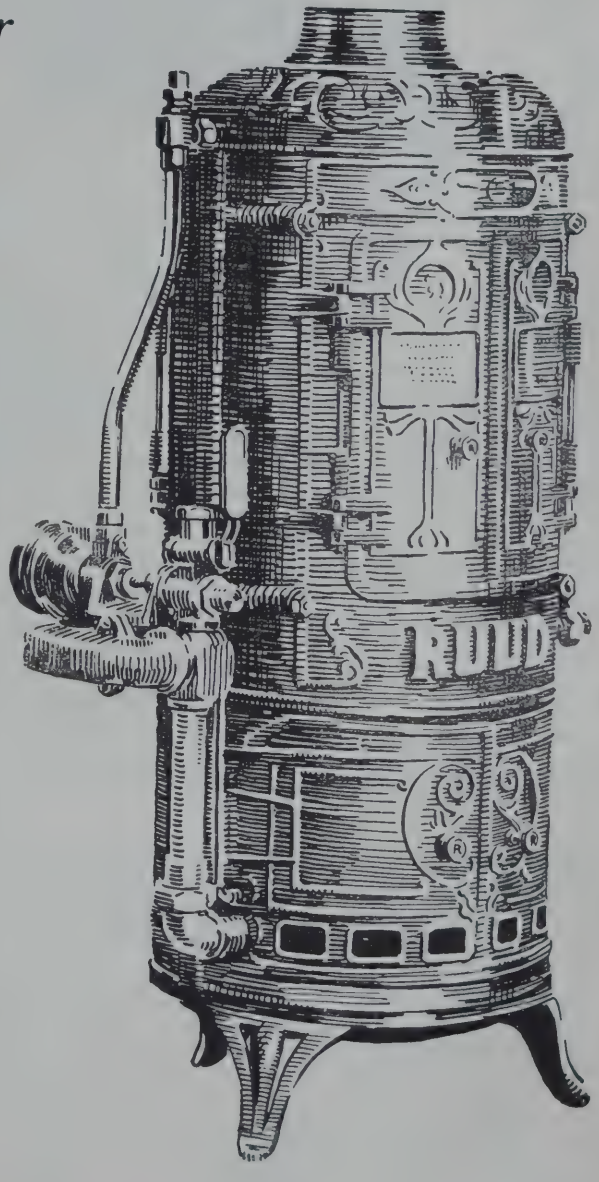
Samson Cordage Works
Boston, Mass.

RUUD AUTOMATIC GAS WATER HEATERS

A Special RUUD Offer To Architects

During November and December

ARCHITECTS can obtain an especially attractive price on a Ruud Automatic Gas Water Heater for use in their own homes. An unusual opportunity to equip your home with Ruud Perfect Hot Water Service. Visit or phone the nearest RUUD Branch or write Department C.



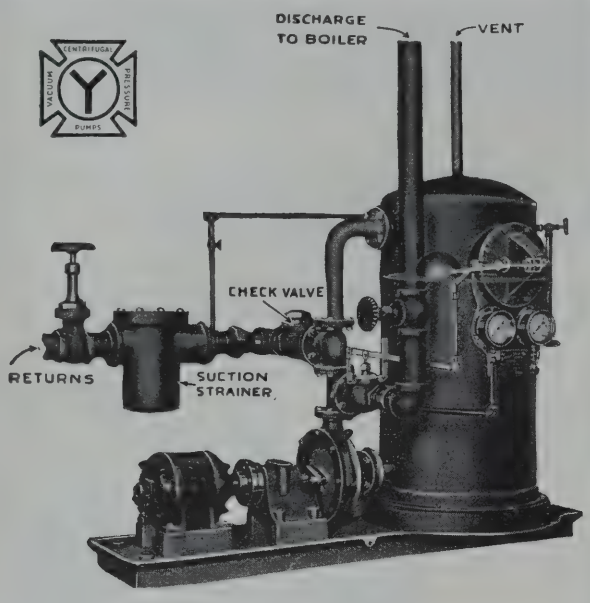
The Ruud Specification Folder

A source of hot water information —complete — convenient — accessible. It fits your file—serves every possible hot water specification. A copy mailed FREE upon request.

Ruud Manufacturing Company

Factories in Pittsburgh, Pa., and Toronto, Ont.

BRANCH OFFICES IN ALL LARGE CITIES



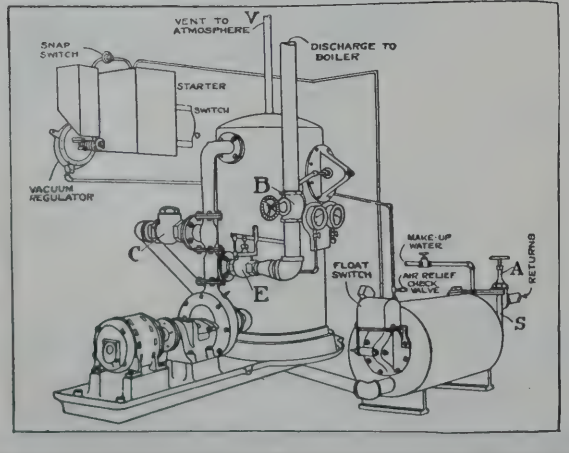
Simplicity is its big advantage

THE simplicity of the Young Centrifugal Vacuum and Boiler Feed Pump is clearly shown in the illustration above. The line drawing reproduced below also reveals the simplicity of the Pump when equipped with automatic vacuum control and with float controlled accumulator tank. This latter installation is particularly desirable where there is blast or other radiation at a low level that should be kept free from condensation.

There is no question of the superiority of Young Pumps for vacuum and low pressure boiler feed work. The fact that these pumps are the acme of simplicity enables an ordinary fireman to take care of their operation with ease.

YOUNG PUMP COMPANY

230 East Ohio Street, Chicago
Factory: MICHIGAN CITY, INDIANA



VENTILATION WITHOUT LIGHT

Excellent Ventilation at Lower Installation Cost

The aim of every architect in designing a building is to keep the cost within reason, but at the same time to create something that is a monument to his skill.

The installation of Ventadoors costs less than transoms, they are far more attractive in appearance and produce excellent ventilation—a combination hard to beat.

Write for literature.

Van Zile Ventilating Corp.
280 Madison Avenue, New York City

VENTADOOR — A VENTILATING PANEL FOR DOORS

VENTADOOR
a Ventilating Panel for Doors

PUMPS

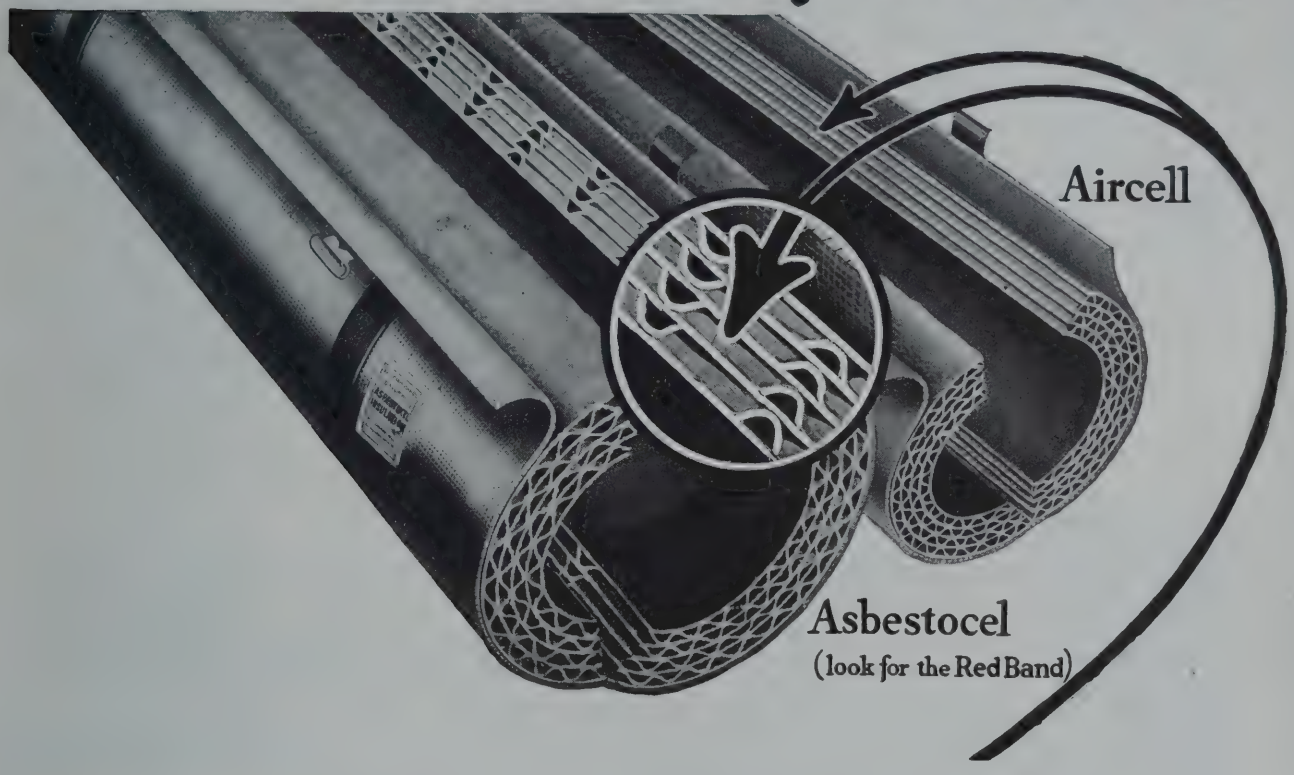
A type for every service

Bulletins on request

THE GOULDS MANUFACTURING CO.
SENECA FALLS, N. Y.
Branches or Agents in All Principal Cities

GOULDS

Over 20 times
the number of air-cells



TWENTY small closed cells are more efficient as a heating-pipe insulation than one large open cell.

Johns-Manville Improved Asbestocel has over twenty times the number of air cells per 3 foot section than an equal length of ordinary pipe covering. Cross corrugations running around the section break up the lengthwise corrugations into small, closed, isolated cells. In ordinary pipe covering the corrugations extend the entire length of the section and are open at the ends. Through them air may circulate freely.

Because of this greater number of small cells, Improved Asbestocel saves more heat and more coal. And it lasts longer because added corrugations give increased strength.

Specify Improved Asbestocel. You can always identify it by the red band at each end of every section.

JOHNS-MANVILLE Incorporated, 292 Madison Avenue at 41st St., New York City
Branches in 62 Large Cities For Canada: Canadian Johns-Manville Co., Ltd., Toronto

Through Asbestos and its allied products
INSULATION
BRAKE LININGS
ROOFINGS
PACKINGS
CEMENTS
FIRE PREVENTION PRODUCTS

JOHNS-MANVILLE
Improved
Asbestocel

The DUNHAM REG. TRADE MARK HEATING SERVICE

ONE of the landmarks of Chicago's famous "North Shore" is the Dunhamized residential Lake Shore Drive Hotel which is located at No. 181 on The Drive.

This nationally known hotel is beautifully situated on the shores of Lake Michigan, adjoining picturesque Lincoln Park, and because of its appointments and cuisine is one of the city's social centres.

THE LAKE SHORE DRIVE HOTEL, Chicago

William A. Buescher, Manager

Fugard & Knapp Architects — Wm. J. Hoyer Co. Htg. Contractors — P. G. Burt Con. Engineer

21730 sq. ft. radiation — 734 Dunham Radiator Traps and Valves

C. A. DUNHAM CO.

230 East Ohio Street, Chicago

The Same Fire Warms the Building and Heats Hot Water

Economy of operation is the by-word in these days of high fuel cost, so if you specify EXCELSO, the heater that supplies unlimited quantities of hot water without cost, by utilizing heating plant fire, it is sure to delight your clients.

With this feature of economy go other EXCELSO advantages—no matter how insistent the demand, EXCELSO keeps the tank continually filled; a simple and thorough construction insures dependability and durability of service; the time and effort of a separate hot water heater fire is eliminated. No building can be quite modern without the very efficient and very economical EXCELSO water heater.

Tell us the type of building and heating plant, and we shall be glad to recommend the proper model and size of EXCELSO, together with other details in which you will be interested.

EXCELSO SPECIALTY WORKS, Inc.

369 EXCELSO BLDG. BUFFALO, N. Y.

EXCELSO WATER HEATERS

Sold by All Plumbers and Steamfitters

WINTERTIME

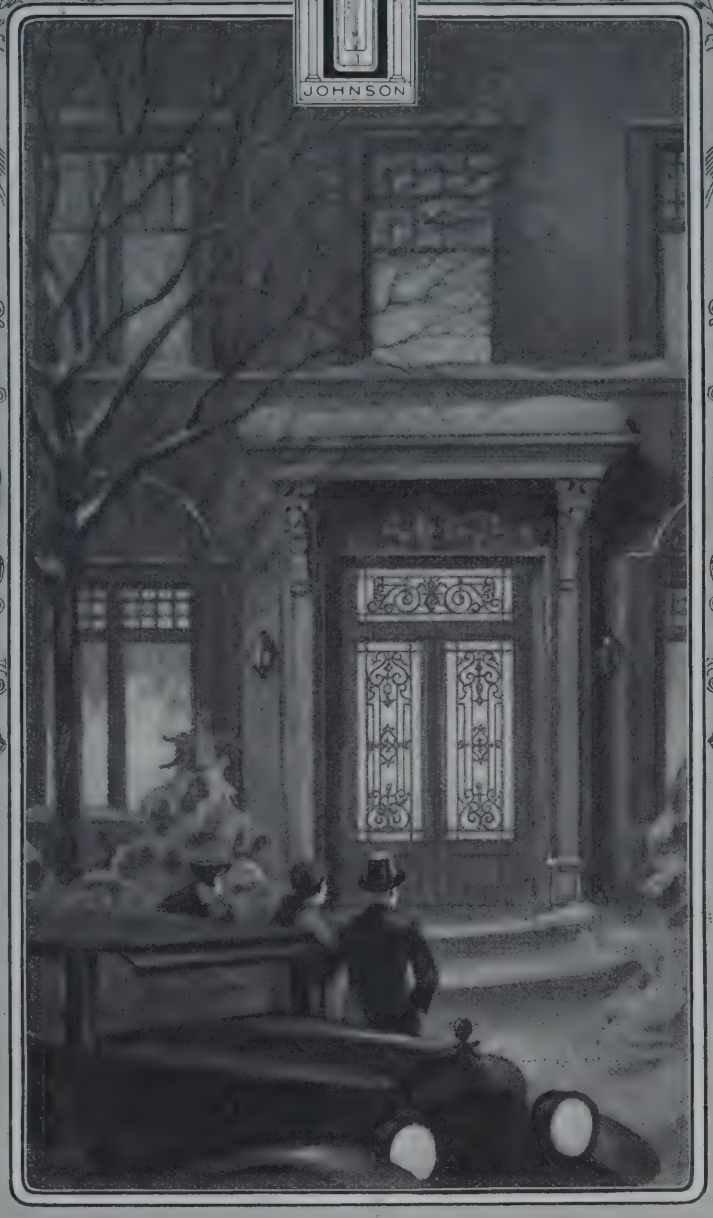
tests the real worth of a ventilator. Never have we had a complaint of a snow-clogged

"GLOBE" VENTILATOR

"GLOBE" Ventilators are constructed to give perfect ventilation at minimum expense and they require no attention whatever.

GLOBE VENTILATOR CO.

Troy, N. Y.



What little more does it mean to add the cost of the Johnson Pneumatic System of Temperature Regulation to the already fine home, or office structure. And what greatly more it means to secure the refinements which The Johnson system gives. On the one hand, the cost will be returned the first three years in the saving of fuel. On the other hand, once installed and the benefits derived, its worth becomes invaluable.

JOHNSON SERVICE COMPANY, MILWAUKEE

AUTOMATIC TEMPERATURE REGULATION FOR 38 YEARS TWENTY-EIGHT BRANCHES UNITED STATES AND CANADA

JOHNSON

HOTEL ROOSEVELT

United Hotels Company of America, *Owners*
George B. Post & Sons, *Architects*

Cleaning Requirements for Hotels

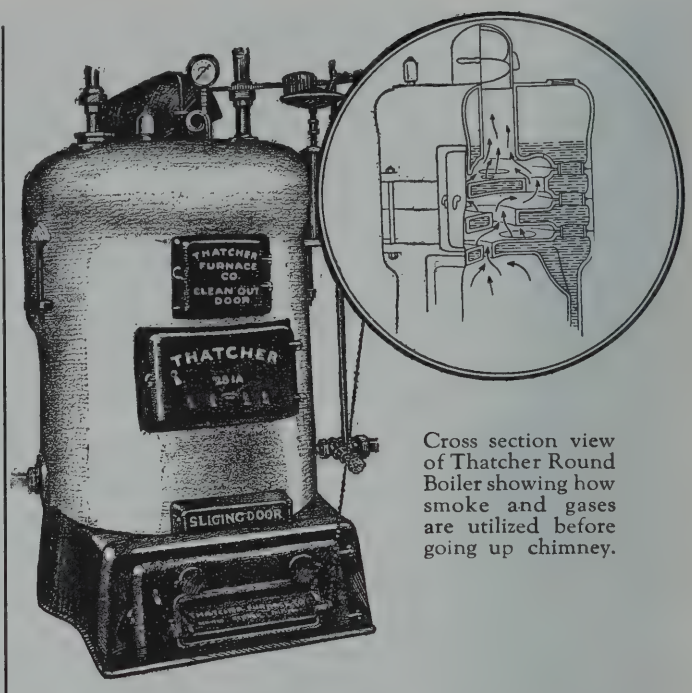
NONE of the mechanical equipment used in earlier United Hotels passed unchallenged for the new twelve million dollar Hotel Roosevelt. Everything was selected to meet the highest requirements of modern hotel science.

Spencer Central Cleaning Systems under this exacting test were not found wanting. Again our installations keep pace with the growing list of United properties.

Architects planning hotels are invited to investigate the Spencer System, which is the recognized standard for fine buildings of all types.

SPENCER TURBINE CO.
HARTFORD, CONN.

SPENCER
CENTRAL
CLEANING
SYSTEMS



Cross section view of Thatcher Round Boiler showing how smoke and gases are utilized before going up chimney.

Thatcher "Staggered Fire Travel" puts the smoke and gases to work

BEFORE the valuable hot gases and smoke in a Thatcher Round Boiler reach the chimney they must pass back and forth over the large heating surfaces many times. This scientific "Staggered Fire Travel" compels the smoke and gases to give up their important heat units, instead of allowing them to escape up the chimney.

This arrangement also provides additional heating surface which cuts down on the amount of coal necessary to keep the house comfortable in all weathers.

Thatcher Round Boilers are backed by 74 years practical manufacturing experience.

Write for illustrated Boiler Catalog giving full details, specifications and ratings of all Thatcher Boilers. A valuable hand book and reference in the drafting room.

THATCHER HEATERS & RANGES

THATCHER FURNACE COMPANY
Makers of GOOD Heaters and Ranges Since 1850

Eastern Display Rooms
133-135 West 35th St.
New York, N. Y.

Thatcher Building
39-41 St. Francis St.
NEWARK, N. J.

Western Display Rooms
341 N. Clark St.
Chicago, Ill.

A factor of even greater importance than our broad guarantee is the 35 years of honest, conscientious manufacture back of every Capitol Boiler.

In all these years there has never been the slightest deviation from the rigid policy of producing only products of the highest quality.

It is extremely gratifying to know that in both public and private buildings, wherever Capitol Boilers are used, they have unfailingly demonstrated that quality.

Architects and heating contractors specify them with absolute confidence. They know that for utter dependability and for extracting the full value from fuel there is nothing superior in the entire heating industry.

UNITED STATES RADIATOR CORPORATION
General Offices, Detroit, Michigan

Branch and Sales Offices

*Boston	*Harrison, N. J.	*Cleveland	*Milwaukee	*Kansas City
*Springfield, Mass.	*Philadelphia	*Columbus	*Indianapolis	*Des Moines
*Portland, Me.	*Baltimore	*Cincinnati	*Louisville	*Omaha
*Providence, R. I.	Buffalo	*Detroit	*St. Paul	*Denver
New York	Pittsburgh	*Chicago	*St. Louis	*Seattle
*Brooklyn				*Portland, Ore.

*Warehouse stocks carried at points indicated by star

Capitol Boilers

Architect:
Harry Hake

Heating Contractors:
Norwood Exchange, (above) J. Gill Davis
West Exchange, (left) Harry L. Bachler

The Cincinnati & Suburban Bell Telephone Company buildings now heated with Bryant Gas Boilers

A UNIFORM temperature in all kinds of weather, without labor or attention, is now maintained in all these buildings. Our engineering department will gladly cooperate with you in solving any heating problem.

THE BRYANT HEATER & MFG. COMPANY
962 E. 72nd St., Cleveland, Ohio Branch Offices in Principal Cities

BRYANT automatic GAS HEATING
System for Water and Vapor

SILENCE!

Wherever absolute quietness is desirable, the discerning architect or engineer selects "Chicago" Pumps. He knows that he can depend upon them to operate silently and faithfully.

That is why they were selected for the Allerton Club, at Chicago; the Walker Hotel, at Washington; the Equitable Life Building, at Des Moines; the Nicollet Hotel, at Minneapolis; and many other prominent buildings in every section of the country.

You would like to see a "Chicago" outfit at work. You would appreciate the utter lack of vibration, and the ease with which the pump carries its load. You could stand close enough to touch it with your hand, and you would hardly know it was running.

To make pumps like this, it is necessary that we select the finest materials and build them with meticulous care into scientifically designed machines.

Write for our Catalog. It contains interesting and valuable information

Boiler Feed
House Supply
Circulating
Pneumatic System

Chicago Pump Company
2316 Wolfram St., Chicago, Ill.

Bilge
Sewage
Condensation
Vacuum

How we know it's smokeless

WE know that the IDEAL Smokeless Boiler is truly smokeless because it proves so under the critical eyes of the Institute of Thermal Research. Every IDEAL Boiler before shipment, must meet conditions far more exacting than any it will encounter in actual service.

Ringelman Chart of a recent test run on an IDEAL Smokeless Boiler is reproduced below. The boiler under test was a 13-section, 36″ Smokeless, operating at 80% of rating. The fuel was particularly smoky—Island Creek Bituminous—and analyzing as follows:

Volatile Matter	36.66
Fixed Carbon	56.89
Ash	6.45
Sulphur	1.66
B.T.U.	14330

At 9:10 fire was leveled with a hoe, incident to developing one and one-half smoke, which subsided to zero in one and one-half minutes.

At 9:15 a charge of fuel was fired, developing number one smoke, which dropped to one-half in three minutes and continued one-half for two additional minutes, dropping to zero one minute thereafter.

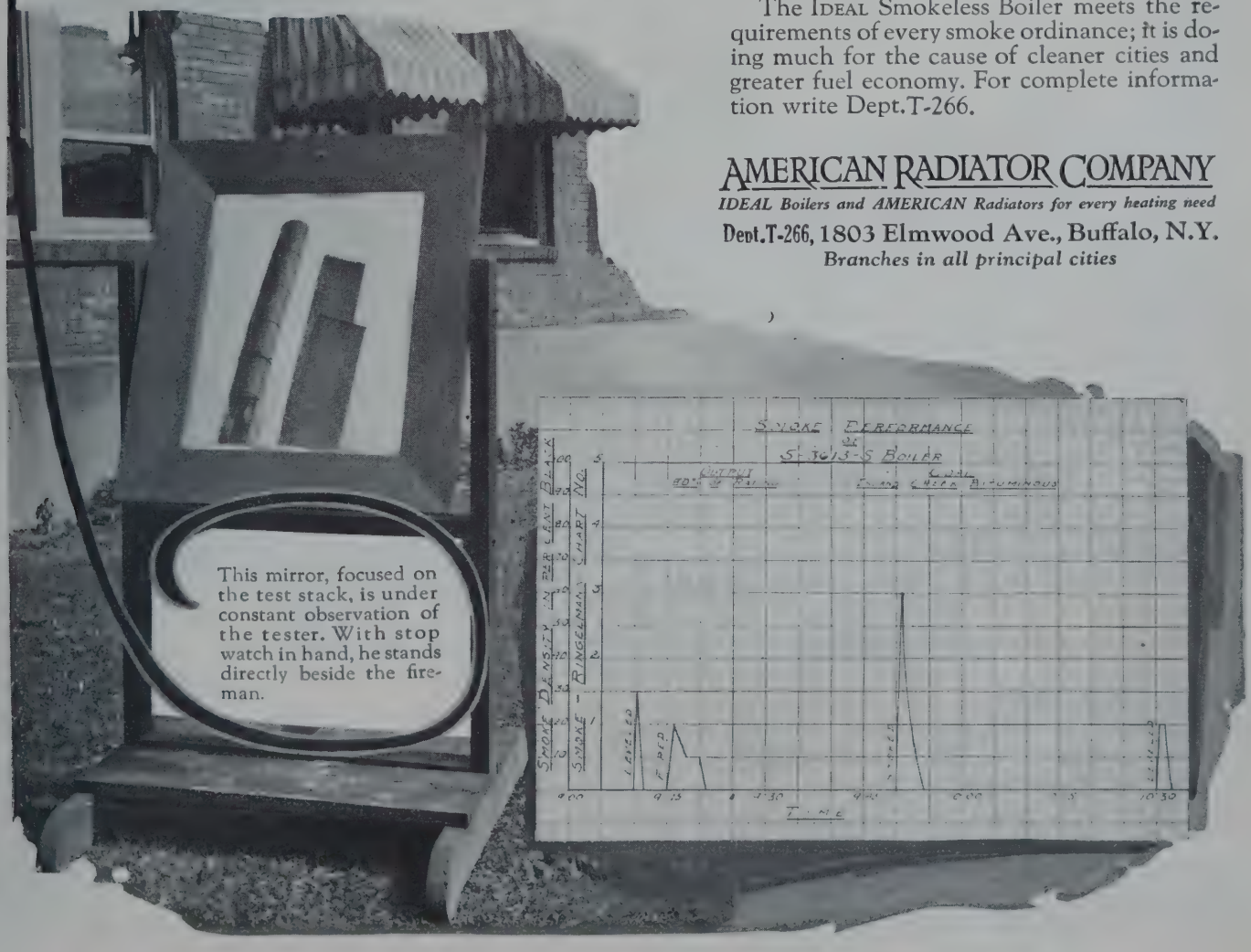
Total smoking period during firing: six minutes

or practically smokeless. No attention thereafter until stoked at 9:50, when it instantly developed number three for a flash, subsiding immediately to zero four minutes thereafter, etc.

The time of greatest smoke is at any stoking period. The time of least smoke is at any firing period. Between these two periods there is no smoke.

The IDEAL Smokeless Boiler meets the requirements of every smoke ordinance; it is doing much for the cause of cleaner cities and greater fuel economy. For complete information write Dept.T-266.

AMERICAN RADIATOR COMPANY
IDEAL Boilers and AMERICAN Radiators for every heating need
Dept.T-266, 1803 Elmwood Ave., Buffalo, N.Y.
Branches in all principal cities



Contractor and Plumber Are Forgotten—But They Remember You

From the owner's viewpoint, every instance of fault or failure in a building or home of your design is a direct reflection upon your reputation as an architect.

Seldom is the owner justified in laying such complaints at your door, but because he has forgotten those who actually fabricated his property, you are held responsible.

The annoyance and embarrassment resulting from defective and corroded piping is avoided by many architects who have taken the pains to "sell" their clients the long-life Wrought Iron Pipe marked "Reading."

READING IRON COMPANY
Reading, Penna.

World's Largest Manufacturers of Genuine Wrought Iron Pipe

Boston	Baltimore	Chicago	Tulsa
New York	Pittsburgh	Seattle	Houston
Philadelphia	Cincinnati	Los Angeles	St. Louis

READING PIPE
GENUINE WROUGHT IRON

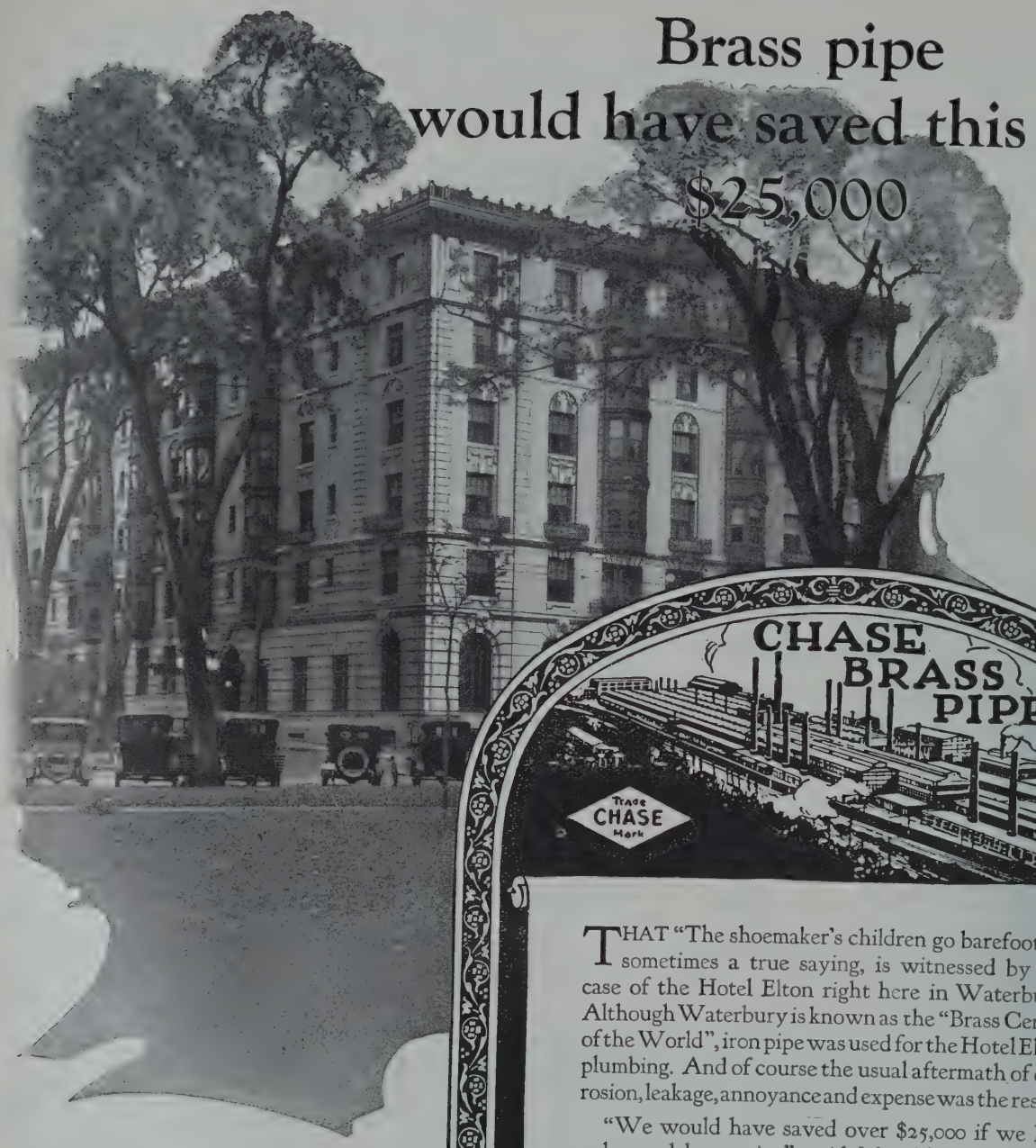
Service and Permanence

were the ideals aimed for in the erection of the Postum Office Building. It will be significant to those who decide upon the piping requirements for similar installations that the major requirements of this building were met with "NATIONAL"—The Recognized Standard of Wrought Pipe. "NATIONAL" Bulletin No. 25 contains useful data on pipe for building purposes. A copy will be sent upon request.

NATIONAL TUBE COMPANY, PITTSBURGH, PA.

District Sales Offices in the Larger Cities

Brass pipe would have saved this hotel $25,000



CHASE BRASS PIPE

Trade CHASE Mark

THAT "The shoemaker's children go barefoot" is sometimes a true saying, is witnessed by the case of the Hotel Elton right here in Waterbury. Although Waterbury is known as the "Brass Center of the World", iron pipe was used for the Hotel Elton plumbing. And of course the usual aftermath of corrosion, leakage, annoyance and expense was the result.

"We would have saved over $25,000 if we had only used brass pipe", said Mr. Almon C. Judd, manager and owner. "One section of our pipe was renewed five times within fifteen years. Iron pipe has kept the Elton plumbing in a continual state of upset. It isn't the first cost of the pipe that counts; it's the final expense".

CHASE Brass Pipe is the pipe of lowest "final expense". Every length is stamped with the CHASE name and the CHASE Diamond trademark — the stamp of guaranteed quality.

HOTEL ELTON
WATERBURY, CONN.

Architects
GREGGS & HUNT
Associate Architects
BOWDITCH & STRATTON

CHASE METAL WORKS

Division of Chase Companies Inc.
WATERBURY CONNECTICUT

PLANTS
CHASE METAL WORKS — Trade CHASE Mark — CHASE ROLLING MILLS

Member Copper and Brass Research Association

0120-17

BYERS

GENUINE WROUGHT IRON PIPE

Old building in oval belongs to Military Home, Dayton, Ohio, the home of thousands of Civil War Veterans. Many miles of Byers pipe laid underground and installed in the buildings, is in good condition after nearly half a century of service.

RIGHT: *San Joaquin Light & Power Company, Fresno, California. Engineers and Builders: The R. F. Felchlin Company. Byers pipe for heating system.*

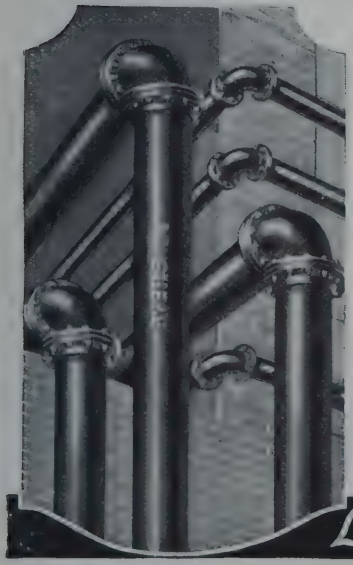
LEFT: *Residence at Wheeling, W. Va. Architect: Albert F. Dayton. Byers pipe for Plumbing and Heating.*

Spending a Dollar to Save Ten

THE durability of a plumbing, heating or power system depends, above all, on the pipe. Year in and year out, corrosion is viciously attacking the pipe metal from within. The smallest leak spells expense and damage tenfold greater than the cost of the pipe.

Byers pipe is made of genuine old-fashioned wrought iron, incorporating layer upon layer of microscopic silicate bands which protect the metal from corrosion. These barriers against rust and destruction, while entirely absent in cheaper pipe, are responsible for the long lasting qualities which have made Byers pipe famous. In every city, you may see buildings in which Byers pipe has given a lifetime of service and is still in good condition.

When you build, make sure that Byers pipe is installed in the plumbing, heating and other pipe systems. Every extra dollar spent for Byers pipe, saves ten dollars in future repairs.



"On the Trail of Byers Pipe" contains illustrations of well-known old buildings in which Byers pipe was installed upwards of 30 and 40 years ago. Copy free on request

A. M. BYERS COMPANY, PITTSBURGH, PA., *Established 1864*

New York Philadelphia Boston Chicago Houston

Distributors in all Jobbing Centers

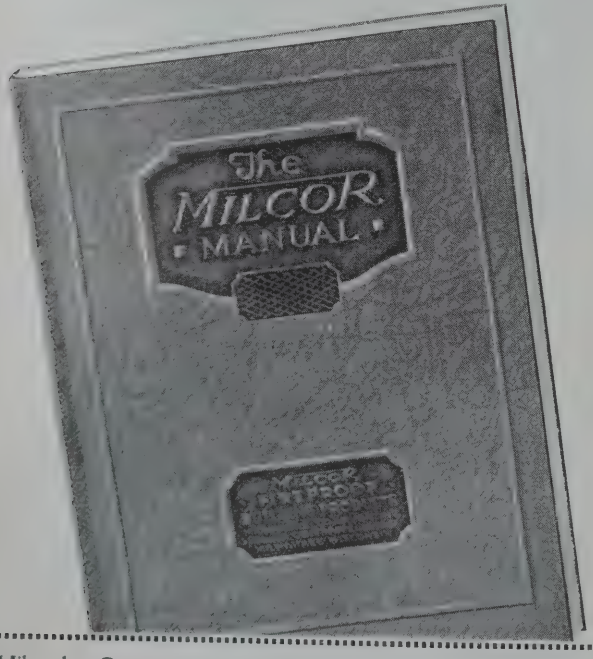
Look for the Name and Year rolled in every length

Two Data Books

FREE—but worth a lot to you. These valuable Data Books are brimfull of useful information. They are more than merely catalogs. You should have them in your files and you will find occasion to refer to them frequently. Write for your copies today, SURE, while you have the subject fresh in mind.

The Book above is 64 pages, in five colors
—the one below is 64 pages, in four colors.

MILWAUKEE CORRUGATING COMPANY, Milwaukee, Wis.
Chicago Kansas City La Crosse Minneapolis



Milwaukee Corrugating Co., Milwaukee, Wis.
I would like to have a copy of these books:

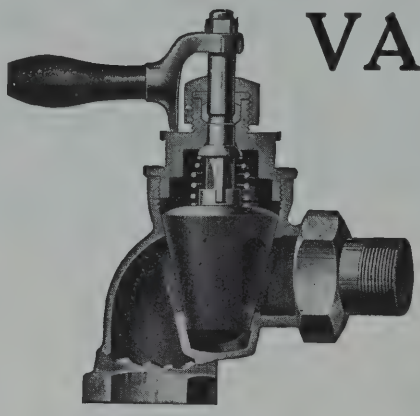
☐ Milcor Architectural Sheet Metal Guide.
☐ The Milcor Manual on Firesafe Construction.

Name _____
Address _____
City and State _____

GORTON

QUARTER TURN

VALVE



A Quarter Turn of the Wrist Opens or Closes this Valve

A Packing Lock Stem, with Ground Shoulder seating in bonnet, insures a Tight Valve that Stays Tight.

Send for Catalogue showing why.

GORTON & LIDGERWOOD CO.
96 Liberty Street, New York, N. Y.

C. W. Bedell, 273 Congress St., Boston, Mass.
Duane L. Bliss, Jr., Rialto Bldg., San Francisco, Cal.
John H. Dodd, 1505 N. Haskell Ave., Dallas, Texas
H. M. Gassman, 513 N. 21st St., Birmingham, Ala.
Chas. A. Munn, 155 N. Clark St., Chicago, Ill.
Wm. G. Moorman, 325 Ellicott Sq., Buffalo, N. Y.
J. E. Perkins Co., 113 E. Franklin St., Baltimore, Md.

It pays *you to know and* recommend

KEWANEE

Make yourself the leading home-builders' counselor of your community—give the *right* answer to every homebuilder's problem, and you'll have more work than you can do—at your own prices.

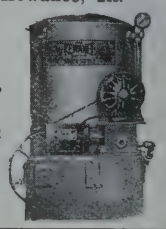
That's why it pays you to recommend KEWANEE for any job of private water supply, electric light or sewage disposal—from bungalow to country estate or club. Over 200 systems and our quarter century of experience insure a correct job for every man's need.

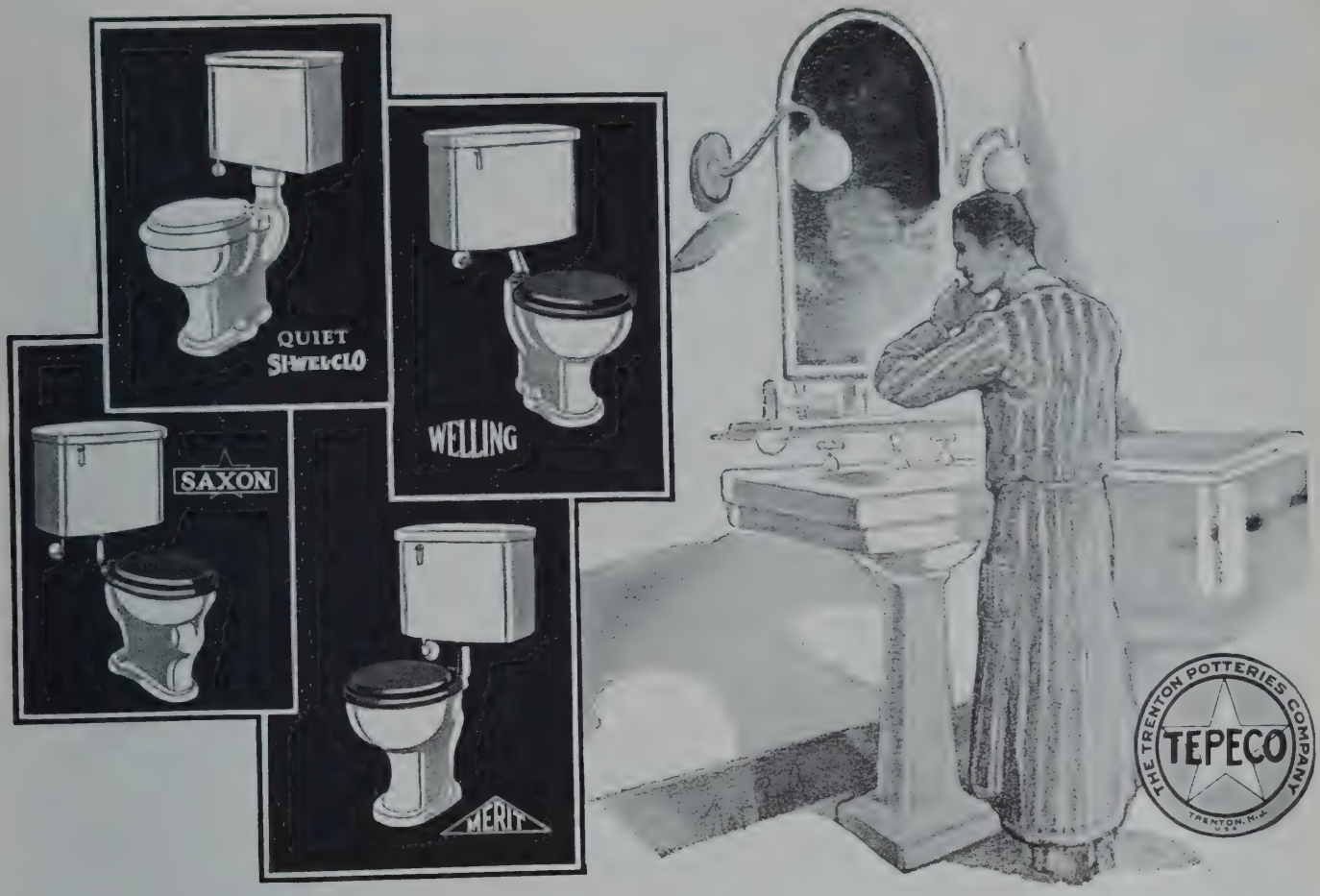
Our Architect's Specification Book enables you to plan any installation of private water supply, electric light or sewage disposal. KEWANEE special engineering counsel is free—at your request.

Write for the KEWANEE Specification Book NOW

KEWANEE PRIVATE UTILITIES CO.
442 Franklin St., Kewanee, Ill.

KEWANEE
"Bungalow Model" Water Supply System
Now $140





WHILE taste may guide you in choosing the design of bathtub or lavatory, the sanitary importance of the water closet is such that it is best to rely upon the judgment of a reputable manufacturer.

One of good quality is a protection against foul air, sewer gas, and disease germs. It is a protection against repairs to tank and fittings. "Tepeco," the world's largest maker of All-Clay Plumbing Fixtures, offers for residential purposes the four recognized types—each in its class, and at its price the best that can be made. We believe it will pay you to install one of them.

"Si-wel-clo" .	$97.50
"Welling" . .	60.50
"Merit" . .	51.00
"Saxon" . .	45.50

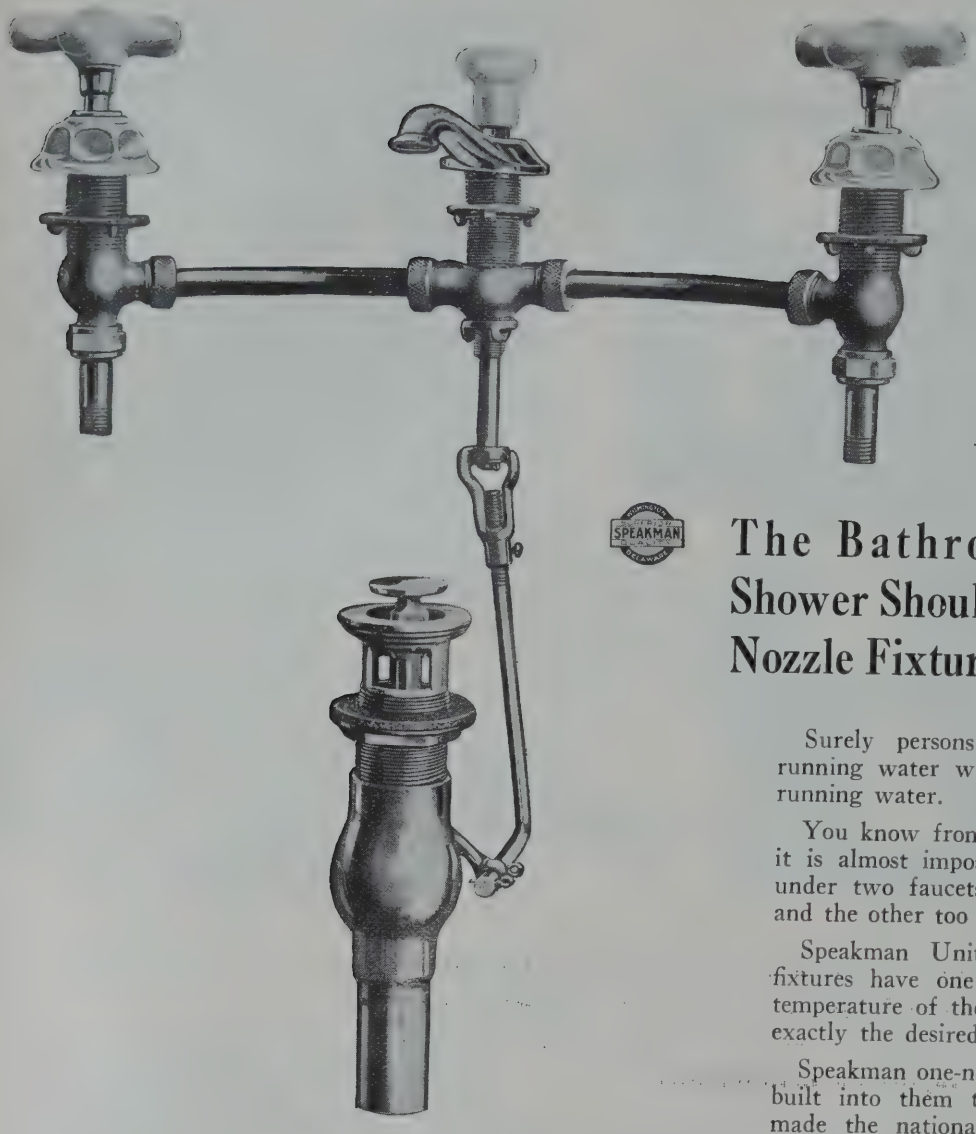
F. O. B. Trenton

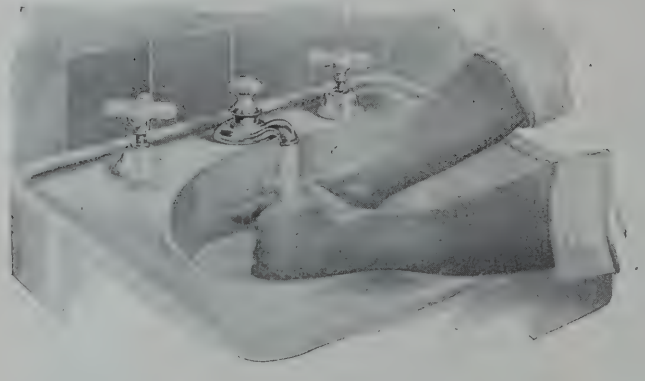
Send for our free Plan Book—"Bathrooms of Character"

THE TRENTON POTTERIES COMPANY
TRENTON, N. J., U. S. A.

NEW YORK BOSTON SAN FRANCISCO

TEPECO Water Closets
FOR EVERY PLACE AND PURSE





The Bathroom That Has A Shower Should Also Have A One-Nozzle Fixture on the Lavatory—

Surely persons who wish to *Bathe* in running water will also desire to *Wash* in running water.

You know from your own experience that it is almost impossible to wash comfortably under two faucets — one is usually too hot and the other too cold.

Speakman Unit and Unit-Acto lavatory fixtures have one nozzle which allows the temperature of the water to be regulated to exactly the desired degree.

Speakman one-nozzle lavatory fixtures have built into them the same quality that has made the national reputation of Speakman Showers. These lavatory fixtures fit practically all existing lavatories and can always be had on new lavatories.

Escutcheons and handles on Speakman lavatory fixtures harmonize perfectly with those on Speakman Showers—all are finest American-made china, extra heavy.

We'll be glad to send out Catalog H, showing Speakman lavatory fixtures and showers—the entire Speakman line is illustrated and described. This catalog has been made up loose-leaf for your files, size 10⅝ x 8½ inches.

SPEAKMAN COMPANY

Wilmington, Delaware

SPEAKMAN SHOWERS

AND FIXTURES

16-inch Jenkins Standard Iron Body Gate Valve, flanged, with rising spindle installed in the main steam line

Jenkins Bronze Fire Line Valves are installed in all fire lines throughout the hotel.

THE ROOSEVELT

QUOTING the management, "The Roosevelt shall be first and last an agreeable 'other home' for every man, woman and child who enters its portals." And Jenkins Valves have a significant part in fulfilling this promise.

Guest comfort and satisfaction are dependent in a large measure on the performance of power plant, plumbing and heating equipment, for which hundreds of Jenkins Valves are used.

The Roosevelt is the last word in fireproof construction, and also has adequate fire protection service—both highly essential to safety. Fire line outlets are equipped with Jenkins Fire Line Valves because they hold pressure without leakage, open quickly and do not stick or corrode at the seat.

Furthermore, Jenkins Valves, due to freedom from costly repairs and replacements, reduce maintenance costs, and this makes for bigger returns on hotel investments.

Write for our new Hotel Booklet.

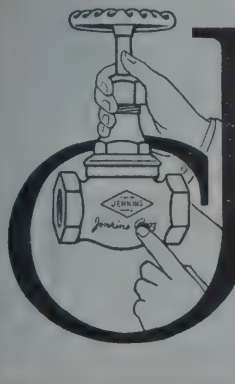
JENKINS BROS.

80 White Street . . . . New York, N. Y.
524 Atlantic Avenue . . . Boston, Mass.
133 North Seventh Street, Philadelphia, Pa.
646 Washington Boulevard . Chicago, Ill

JENKINS BROS., LIMITED
Montreal, Canada London, England

Jenkins Valves on laundry wash wheels.

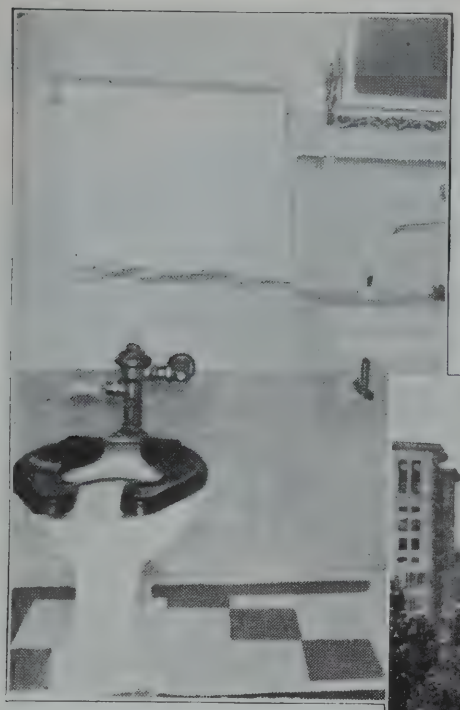
Three 14-inch Jenkins Standard Iron Body Gate Valves, flanged, with rising spindle installed in exhaust line



Always marked with the "Diamond"

Jenkins Valves

SINCE 1864



But one of many testimonials received from leading hotels:

THE TYLER, Louisville, Ky.

"In the six years your Whale-Bone-Ite seats have been installed in this hotel we have not had one bit of trouble with them. They have needed no refinishing, and to our knowledge they are the best seats on the market for wear, appearance and sanitation. . . ."

The Hotel Biltmore, Los Angeles, the latest word in modern hotels. Entirely Whale-Bone-Ite equipped.

No Whale-Bone-Ite toilet seat has ever worn out

Hotels demand them because there is no upkeep or repair cost—always good looking, sanitary with least attention

IN all the years we've been making Whale-Bone-Ite toilet seats, not one of them has ever worn out.

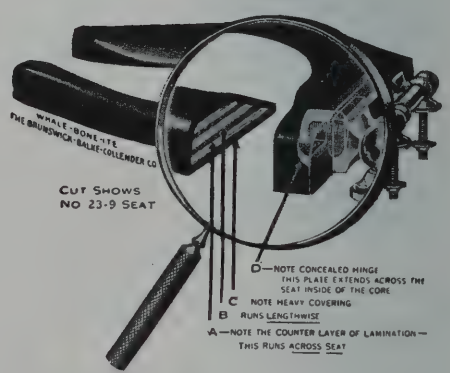
We absolutely guarantee every seat we make. The ten outstanding exclusive features of Whale-Bone-Ite are:

Permanent Durability	Acid-Proof
One-Piece Construction	Non-Inflammable
Non-Warping	Permanent Finish
Sanitary	No Exposed Metal
Easiest Cleaned	Comfortable

That is why today leading hotels everywhere insist upon Whale-Bone-Ite as original equipment, and older hotels are making their *final replacement* with them.

Plumbers or Jobbers can give you complete information.
Or write direct: *Whale-Bone-Ite Division*

THE BRUNSWICK-BALKE-COLLENDER CO.
623 South Wabash Ave., Chicago, Ill.



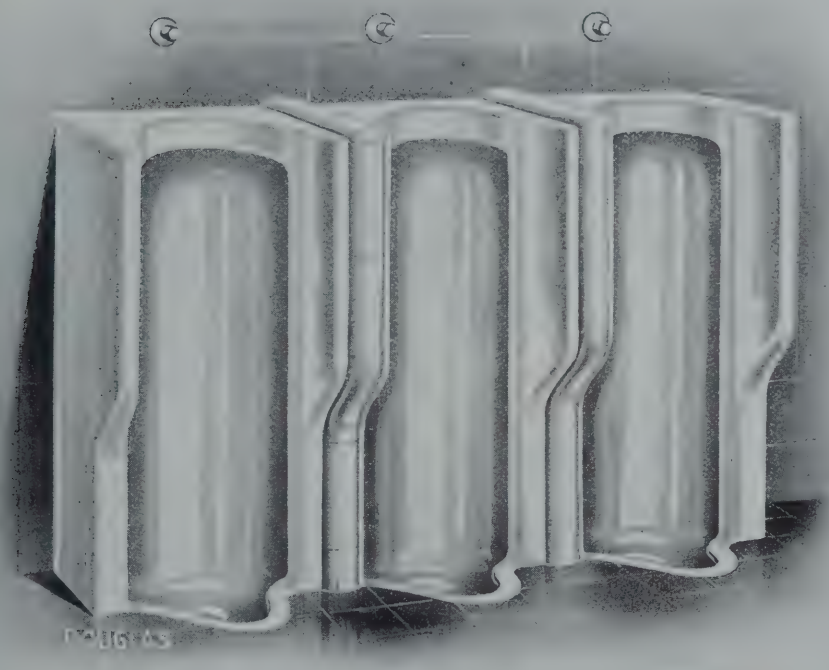
Whale-Bone-Ite seats come in ebony or mahogany to harmonize with your bathroom fittings.

THE BRUNSWICK-BALKE-COLLENDER-CO.
WHALE-BONE-ITE
REG. U.S. PAT. OFF. 1914.
SEAT

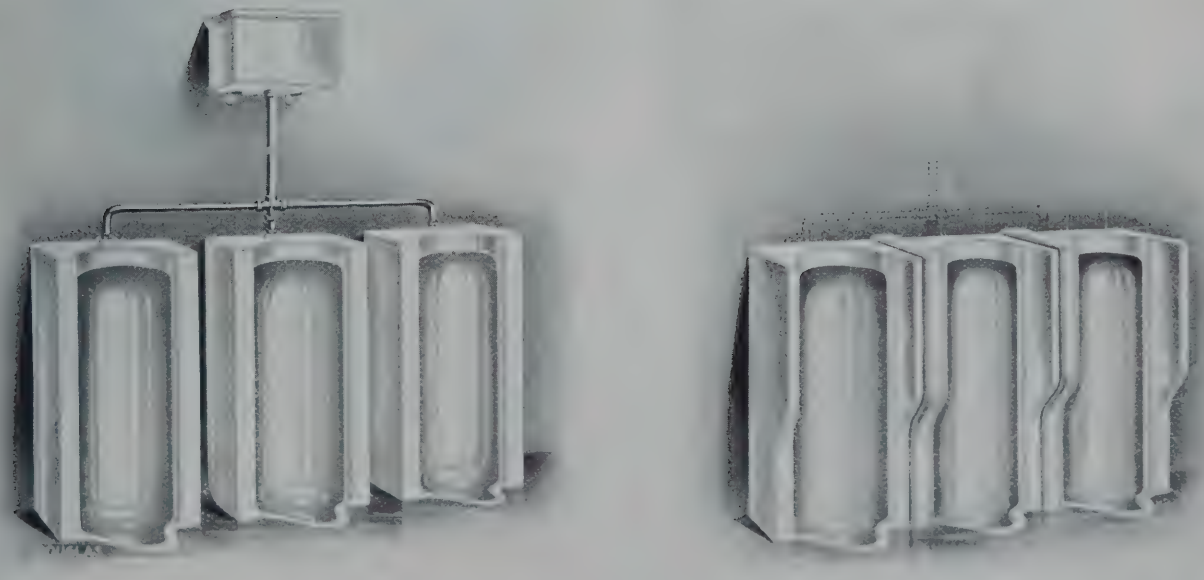
DOUGLAS VITREOUS CHINA STALL URINAL

Impervious to Moisture

Made from the same material as closet bowls and lavatories



Guaranteed not to Craze or Discolor



Ask us for details and descriptive literature.

— Manufactured by —

THE JOHN DOUGLAS COMPANY

General Office, Cincinnati, Ohio **Works, Cincinnati and Trenton**

MADDOCK *Sanitary* Fixtures

Americans viewing Houdon's La Baigneuse, prior to his sculpting George Washington

"objets d'art"

THOMAS MADDOCK bathroom equipment is to be found in the homes of men and women whose discriminating tastes are not assumed.

MADVAL
K-2831

White Vitreous China Pedestal Bidet with flushing rim and integral douche. Fitted with supply valves with all-china handles and escutcheons for supplying hot and cold water to the flushing rim or centre douche and pop-up waste to retain the water in the bowl when desired.

THOS. MADDOCK'S SONS CO. TRENTON, N.J.

THOMAS MADDOCK'S SONS COMPANY
Trenton, New Jersey.

The OLYMPIC HOTEL, Seattle, Wash.: Geo. B. Post & Sons, New York, Architects; Seattle Plumbing Supply Co., Jobbers; Ashwell & Twist, Seattle, Plumbers

KOHLER

And the OLYMPIC HOTEL

One of the finest hotels on the Pacific slope—the Olympic—is nearing completion in Seattle.

This impressive hotel will have Kohler "Viceroy" built-in baths in 549 of its 609 bathrooms (other bathrooms being equipped with shower baths only).

* * *

The selection of Kohler Enameled Plumbing Ware for the Olympic and other installations of the first importance reflects the favor which this ware has won with architects through its beauty of design and the durability and uniform whiteness of its enamel.

The mark "Kohler, U. S. A.," unobtrusively fused into the enamel of every Kohler fixture, betokens the maker's pride in a worthy product.

KOHLER OF KOHLER

Kohler Co., *Founded 1873*, Kohler, Wisconsin
Shipping Point, Sheboygan, Wisconsin

BRANCHES IN PRINCIPAL CITIES

MANUFACTURERS OF ENAMELED PLUMBING WARE AND KOHLER AUTOMATIC POWER AND LIGHT 110 VOLT D. C.

Manufacturers' Catalogs

THE ATHEY COMPANY, Chicago. "Athey Weatherstrips." An Invaluable Aid to Economical Heating.

Reliable and economical heating is not entirely a matter of using sufficient fuel in a system which is of the best and which is equipped with all the devices which make for excellent service while promoting economy. Much depends upon devices for excluding the cold, and chief among such devices is the weatherstrip which prevents the entrance of strong currents of air through the crevices between window sash and the frames in which they are held.

The same skill which has been devoted to perfecting other details of equipment has been directed toward perfecting the weatherstrip, which now appears in a form which represents efficiency itself. Ordinary, so-called weatherstripping keeps out very little of the cold air, dust, dirt, soot and noise. If fitted too tightly, the window sticks and is hard to operate; if applied in any other manner the windows rattle; it is unsightly and a constant annoyance and expense.

Since the days of the old wood and rubber weatherstrip there have been many improvements, but perfection was to be attained only by study and experiment, and to this concern, long known for the excellence of its output, belongs the credit for continuing research and experiment until it was possible to offer to the building public the Athey Cloth-Lined Metal Weatherstrip, described in this folder.

This equipment consists of a metal (zinc) rail, shaped with a tongue or sealing rib at a right angle to the base, in the back of which is inserted a strip of cloth; this rail is placed in the runway of a window and fastened in place, the cloth in back of the rail preventing any back leakage. In a groove made in the edge of the sash is placed a metal cloth-lined channel, securely fastened in place and in the cloth-lined channel the tongue or sealing rib of the rail operates easily, maintaining at all times a perfect contact. Dampness cannot pass it. It is therefore a great boon to rheumatic sufferers and others affected by dampness and humidity; it is now in use in many of the leading hospitals throughout the country for this and other reasons.

Drafts are impossible from windows equipped with it, and no soot or dust of any kind can find its way through. It is the only equipment that is successfully used in the southwestern section of the country, where dust storms are of frequent occurrence. Wherever soft coal is used the value of Athey Cloth-Lined Strip is apparent, for there are no crevices for the soot to work through. The housekeeper knows what this means to the hangings and draperies.

From an economical standpoint, it is an investment (not an expense), for extensive experiments have shown that considerably less radiation is required, and radiation means fuel consumption. The saving in cost of fuel will soon pay for the Athey strip. In a large building on Chicago's lake front, the installation of Athey Cloth-Lined Metal Weatherstrips saved 572 tons of coal in one heating season. At an average of even $6 a ton for coal that means a saving of $3432. Yet the cost of installing the Athey strip was less than $5000. The name of this building, and the engineer who furnished this data will be given anyone interested upon request.

THE ABERTHAW COMPANY, Boston. "Factory Floor Surfaces." An Excellent Work on Floor Construction.

In the designing and planning of an industrial structure the architect and builder may well devote considerable care and thought to the problem presented by the floors. The wear and tear which many manufacturing processes and forms of industry cause to the floors of industrial structures necessitate the installation of the floor best adapted for such use, and of the utmost importance are the welfare and comfort of the workers or operators, so large a part of whose lives is spent in such a structure.

In this little book A. B. MacMillan, Chief Engineer of the Aberthaw Company, discusses the uses of different types of flooring. Floor surfaces divide themselves into three main classes,—(1) wood; (2) granolithic; (3) special materials or proprietary floorings, and each has its advantages which are here set forth and considered. Mr. MacMillan goes with thoroughness into so important a subject, and discusses methods of manufacture or laying as well as the matter of proper materials or ingredients which compose mixtures of cements, concretes, and similar substances, in all this drawing upon the experience and the store of information and data which the Aberthaw Company has built up during years.

THE NATIONAL LIME ASSOCIATION, Washington, "Hydrated Lime Makes Concrete More Workable. Bulletin 311." A Valuable Work on Lime Properties.

The service rendered by the United States Bureau of Standards is valuable to architects, engineers, builders and others to whom accurate knowledge of qualities is important. Recently there has been issued this bulletin based upon research into some matters concerning lime, done by the Bureau and giving the results secured. Tests were made, and the result as published in this bulletin shows conclusively that hydrated lime naturally improves the workability of concrete without exerting a deleterious effect upon the concrete's compressive strength. Workers in concrete find that while strength is of great importance, it is nearly always necessary that work of this character be also pleasing in appearance, and the appearance of structures of concrete depends largely upon the workability of the mixture. Copies of this valuable little brochure will be sent to those who write requesting them to the National Lime Association, 918 G Street N. W., Washington.

Burnham Building, Chicago
D. H. Burnham & Co., Architects
O'Callaghan Bros., Plumbers

The equipment supplied by Clow includes: 79 M-3194 Closets; 516 M-4020 Lavatories; 1 M-4150 Manicure Lavatory; 36 single M-3483 Urinals; 2 batteries of 3 M-3483 Urinals; 40 M-5140 Slop Sinks.

Equipped with "Clow Throughout"

The Burnham Building, Randolph and LaSalle Streets, Chicago, is one of the principal new office buildings in the business and financial section of the city. In size and character it is an outstanding example of a modern business building furnishing the highest class of accommodations and service.

JAMES B. CLOW & SONS
General Offices
534-546 S. FRANKLIN ST., CHICAGO
Sales offices in principal cities

CLOW

Manufacturers' Catalogs and Business Announcements

LIBBEY-OWENS SHEET GLASS CO., Toledo. "Flat Glass." A Work on Use of Glass in Windows.

Use of glass of excellent quality in windows even in buildings of the smallest possible cost is now so general that it seems hardly possible that its use is comparatively recent. In this valuable little volume on the subject we are told that glass was beginning to be used in Rome for windows when Roman civilization was over-run by barbarians from the north of Europe, and that excavations at Pompeii show that glass was used for the windows of certain famous baths. Santa Sophia, built by Justinian in the fifth century, was provided with window screens or frames pierced with openings to receive small sheets of glass, and during the reign of Elizabeth, the great Duke of Northumberland, on leaving his castle, was warned by his steward to remove the glass from its windows to prevent its being stolen.

The present widespread use of glass would seem to be due largely to the study and research of Irving W. Colburn, to whom indeed this work is dedicated. An account is given of his efforts, made in the face of almost insuperable difficulties, which led to the revolution in the manufacture of flat glass as we know it. The little volume contains much which is interesting and valuable as bearing on the historical and technical sides of the subject of window glass.

RUDD MANUFACTURING CO., Pittsburgh. "Multi-Copper Coil Automatic Storage Systems"; "Automatic Storage Systems"; "Automatic Hot Water Service for Small Homes"; "Tank Water Heaters"; "Instantaneous Automatic Water Heater." Various other specialties.

Comfort of the occupants of any kind of a residence structure, and indeed of a structure of almost any sort, is to a great extent dependent upon the facilities which are provided for supplying hot water to bathrooms, lavatories, kitchens, pantries, laundries and departments of many kinds. To meet this demand for heaters of countless different types and as widely varying capacities, certain manufacturers have placed upon the market heaters which will serve economically the tiniest cottage or a hotel, apartment house or hospital where the demands are heavy. Selection of a water heater is important.

In the various brochures, catalogs and other publications named here there is covered completely the line of heaters which this widely known manufacturing firm supplies, a line so complete and well balanced that there could be no demand so small or so large that an appropriate heater could not be promptly supplied to meet the needs. It is particularly interesting to note the part which the thermostat plays in connection with some of these Ruud Heaters. It serves a two-fold purpose,—economy and safety. It means economy in that it proportions the quantity of gas used to the amount of water to be heated, turning off the gas automatically when the water has reached necessary temperature.

THE J. G. WILSON CORPORATION, New York, "Sectionfold and Rolling Partitions; Hygienic Wardrobes."

There are countless instances where it is necessary that a large room of some kind be divided at times into a number of smaller rooms without impairing its value for use as one large room where it is necessary to use it as such. This is frequently the case in hotels or clubs where a large banquet room or restaurant is fully as useful when divided into several private banquet rooms or smaller dining rooms. Such subdivision of space is also frequent in churches, and particularly in schools where an auditorium or assembly room may be used ordinarily for a number of classrooms. Sometimes the cost of heating or lighting a large room is avoided by the simple expedient of converting part of it into a smaller room. In all these instances use is being made of movable partitions,—either of the type which when not in use can be folded back against the wall or into wall pockets, or of another type which when not in use can be rolled up.

This brochure fully describes and illustrates the movable partitions of both types made by the J. G. Wilson Corporation. Every detail of data which could be desired by an architect or builder is given, and the mechanism of both types is indicated in diagrams, while in many illustrations there is fully demonstrated the important fact that the use of these partitions in no wise injures the appearance of the rooms where they are used.

Quite as important to a school as movable partitions are the wardrobes which are used for containing the children's clothing. It has been found in some instances that having wardrobes in the schoolrooms rather than in separate rooms is more economical of floor area. When desired such wardrobes may be connected with the ventilating system of a building. Like the movable partitions, the doors of such wardrobes may be arranged to operate in various ways,—in usual door fashion or built to disappear into the wardrobes; or instead of doors the wardrobes may have fronts which fold or roll as do the partitions. The wardrobes made by the J. G. Wilson Corporation are fully as well and favorably known as the partitions made by the same concern, and this brochure gives all details necessary for their use.

VAN RENSSELAER P. SAXE, C.E.

Consulting Engineer

STRUCTURAL STEEL
CONCRETE CONSTRUCTION

Knickerbocker Building Baltimore

IN the Tribune Tower, the "world's greatest newspaper" is seeking to give America its most beautiful office building. The hundred thousand dollars invested in the Tribune architectural competition indicate how far the owners were willing to go in order to find worthy architects.

They were equally as scrupulous in the choice of materials of construction and equipment. In every detail, they sought to preserve the spirit of dignity and fortitude of their newspaper. Cost was not their first consideration, yet the conservative policy of the Tribune forbade lavish expenditure.

The unanimous decision of both owner and architect on Crane plumbing and heating materials is a recognition of Crane quality which is deeply appreciated. To create fixtures, valves and pipe fittings which appeal through their quality, charming designs and economy of lasting service, is ever the rule and guide of Crane design and manufacture.

Tribune Tower, Chicago. Architects, Howells and Hood; General Contractors, Hegeman-Harris Co.; Plumbing Contractors, E. Baggot Co.; Heating Contractors, Mehring and Hanson.

CRANE

CRANE CO., 836 SOUTH MICHIGAN AVENUE, CHICAGO

Branches in all Principal Cities

Manufacturers' Catalogs and Business Announcements

NATIONAL STEEL FABRIC CO., Pittsburgh. "Reinforced Concrete Sidewalks, and Cellar and Garage Floors." Important and Valuable Data on Concrete.

Notwithstanding the great value of concrete for laying driveways, sidewalks and the floors of garages and cellars, it is of course open to the objection that as generally used it often cracks and breaks easily, particularly when exposed to rain which, when it has turned to ice, has a tendency to cause cracking. Concrete has great compressive (crushing or wearing) strength, but like glass it is deficient in tensile (breaking) strength, having only about 1/150 the tensile strength of steel. It was found many years ago that in order to obtain from concrete the utmost possible in the way of structural utility the material must be suitably reinforced, and the wide and constantly increasing use of concrete is due in large measure to the skill of engineers in designing systems of reinforcing.

The use of steel in reinforcing an actual structure of concrete is of course well understood, but the application of much the same principle to strengthening concrete roadways and floors has been slower to develop. The same principle applies, nevertheless, and in this folder illustrations and diagrams explain the use of National Steel Fabric which is laid upon the first layer of concrete, acting as strong reinforcement to the upper layer. The cost of this reinforcement could add but little to the expense of constructing any work in which it would form part, but it more than pays for itself by adding years to the life of a floor or roadway and by the prevention of unsightly breaks and cracks. The use of the fabric presents no problem which the average concrete worker could not master, the illustrations and directions for use given in this folder, in fact, being full and complete and easily followed.

THE NORTON COMPANY, Worcester, Mass. "Norton Floors." A Booklet on Non-slipping Surfaces.

Someone observed recently that the amount of money paid out annually by many a large concern in the form of damages for personal injuries due to slipping and falling would more than pay the cost of preventing any outlay for such injuries for all time to come. Many of the substances likely to be much used for flooring present surfaces which are dangerously slippery, particularly when wet, and it is highly important to use for the treads of stairways, for ramps, areas about elevators or machinery, some material which is not only not slippery to begin with, but which will not become so when wear has worn away the original surface and made the material smooth.

This brochure fully describes the flooring material produced by this well known concern. The first Norton Floor was known as "Alundum Safety Tile." It was so successful in solving the problem of slippery and fast-wearing stairs in places where there had been a hazard that further developments followed. Now there are Norton Floor materials with a non-slip surface suitable for all kinds of buildings, including the highest type of hotel, municipal and office structures, where this product is used in connection with marble, granite, tile and similar building materials.

The principal classifications of Norton Floor products are: Alundum Floor and Stair Tile (semi-vitreous); Alundum Ceramic Mosaic Tile and Treads; Alundum Aggregates; Alundum Aggregate Tile and Treads, and each of these products is described briefly in this booklet.

PITTSBURGH PLATE GLASS COMPANY, Pittsburgh. "Glass and Paints." Their History and Use.

In a carefully written and richly produced volume this firm, one of the foremost among the leaders in its field, issues a treatise upon two materials which, perhaps because they have much in common, are closely associated in the public mind—glass and paint. Unless one had made a study of glass it would hardly be supposed that its history reads like a romance from the Arabian Nights; use of glass in one form or another is enormously old, and each of the many varieties of glass demands study of a matter which is a subject entirely to itself. The particular branch of glass manufacture carried on by the Pittsburgh Plate Glass Company rewards any amount of study which may be given to it. So, too, with paint, without which the modern world would be colorless.

This valuable volume deals not only with the history of glass and paint and the methods of their manufacture, but goes with equal fullness into a description of all the products made by the firm—glass, paints, varnishes and many kinds of brushes.

ANNOUNCEMENTS

G. H. Carsley, Architect, announces the opening of new offices at 634 Mound Street, Helena, Mont.

Talmage C. Hughes has opened new offices for the practice of architecture at 2615 Joy Road, Detroit.

John Noble Pierson & Son, Architects and Engineers, announce the opening of new offices at 200 Jefferson Street, Perth Amboy, N. J.

Alexander Fraser Rose, Engineer and Architect, announces his removal to 510 Essex Building, Minneapolis. Catalogs and samples of manufacturers are desired.

Thomas J. Collopy has opened an office for the practice of architecture at 607 Coppin Building, Covington, Ky. Manufacturers' catalogs and other publications and samples of materials are desired.

What the client remembered

EIGHT months after the plant was completed, the owner had forgotten all the careful, conscientious work of the architect.

For the concrete floor of his building had developed a number of crumbling weak spots. On trucking aisles and around doorways and machinery, there were deep hollows. In places the top surface had completely given way. The air was full of concrete dust—dust as harsh and sharp as fine emery.

One specification the architect had left open. It was only a seemingly unimportant detail — the choice of a floor hardener. Yet that detail was sufficient to offset months of conscientious work. For now it was necessary to hold up production and resurface the floor. That was the only thing the manufacturer remembered about the architect's work.

It is easy for an architect to make certain of turning out a concrete floor that will be lastingly dustproof and wearproof. The way to do that is to specify the oldest and best-proved floor hardener on the market. Its name is Lapidolith.

As confirmation of this you can turn to hundreds of millions of feet of Lapidolized floors in the leading industrial plants of this country—such plants as Ford Motor, Standard Oil, Swift & Company, Bethlehem Steel, etc. Many of the floors that were treated with Lapidolith years ago when it was first developed, are still in service today and in excellent condition.

Lapidolith is a colorless liquid chemical that penetrates the concrete a considerable distance. It produces a fine, even, close-grained wearing surface of crystalline formation. This surface is flint-like in its hardness. It is wearproof, dustproof, waterproof. Truck wheels, scuffing feet, machinery—they do not affect a Lapidolized floor at all.

The price per gallon of Lapidolith is a trifle higher than other so-called "hardeners," but it turns out floors of which you can be permanently proud. When you have once seen the work Lapidolith does, you will never harden concrete floors with anything else. Send for literature giving further information.

LAPIDOLITH
TRADE MARK

Fermo —Hastens the setting of concrete and minimizes the danger of freezing in cold weather. Incorporated in the mix.

Cemcoat —An industrial gloss, eggshell or flat enamel paint that stays white longer than any other paint; that can be washed again and again; usually requires one less coat, and does not powder, crack or peel. Made for both interiors and exteriors, in white and colors.

Hydrocide —A high grade line of water- and damp-proofing products, for walls, foundations, etc. For each particular use there is a special kind of Hydrocide. For instance, on exterior walls where it is desired to preserve the natural beauty of the brick, Hydrocide Colorless is 100 per cent efficient.

L. SONNEBORN SONS, Inc.

114 Fifth Avenue **New York City**

Index to Advertising Announcements

Acme Brick Company 18
Adam Elecrtic Company, Frank 131
Allen, Louis L 48
American Brass Company, The 103
American Cement Tile Mfg. Co 70
American Chain Co 136
American Face Brick Association, The 15
American Laundry Machinery Co ... 139
American Lead Pencil Co 10
American Radiator Company 151
American Seating Company 46
American Sheet and Tin Plate Co .. 71
American Stove Company 119
American Walnut Mfrs. Ass'n 79
Appalachian Marble Company 19
Armstrong Cork and Insulation Company 17
Armstrong's Linoleum 65
Art Metal Construction Company ... 83
Associated Tile Manufacturers 8
Athey Company 88
Automatic Electric Company 111

Batchelder-Wilson Company 10
Berry Bros 56
Betz Company, Frank S 132
Bishopric Manufacturing Co., The .. 40
Bonded Floors Company 47
Brasco Manufacturing Co 63
Brunswick-Balke Collender Co 54, 160
Bryant Heater & Mfg. Company 150
Builder, The 30
Byers Company, A. M 155

Cabot, Samuel 76
California Pine Association 115
Carey Co., The Philip 113
Carney Company, The 23
Carter Bloxonend Flooring Company 67
Chase Metal Works 154
Chicago Pump Company 150
Circle A Products Corporation 32
Cinton Metallic Paint Co 10
Clow & Sons, James B 165
Colt's Patent Fire Arms Mfg. Co ... 120
Common Brick Mfg. Ass'n 16
Conklin-Armstrong Terra Cotta Co. 12
Corbin, P. & F 28
Crane Comapny 167
Crittall Casement Window Company 89
Curtis Companies 66
Curtis Lighting, Inc 132
Cutler Mail Chute Co 82

Dahlstrom Metallic Door Company. 84
Detroit Steel Products Company ... 92
Devoe & Raynolds 57
Dixon Crucible Co., Joseph 26
Douglas Company, The John 161
Dunham Co., C. A 146

Eagle-Picher Lead Company 58, 59
Elevator Supplies Company, Inc 126
Eljer Company 172
Excelso Specialty Works 146

Fain Manufacturing Company 50
Federal Cement Tile Company 74
Fiske & Co 12
French & Co., Samuel H 56
Frink, Inc., I. P 122
Fulton Company, The 105

Galassi Company 66
General Electric Company 133
General Fireproofing Co 91
Georgia Marble Company, The 20
Gillis & Geohegan 120
Glidden Company, The 60
Globe Ventilator Company 146
Gorton & Lidgerwood Co 156
Goulds Manufacturing Co 144
Guastavino Co., R 7
Guth Company, The Edwin F 123

Hart & Hegeman 127
Hartmann Sanders Co 82
Hauserman Co., The E. F 31
Heggie Simplex Boiler Corporation .. 9
Hess Warming & Ventilating Co .. 140
Higgins & Co., Charles M 30
Hitchings & Co 116
Hockaday Co., The 109
Hoffman Manufacturing Co., Andrew 84
Hoffman Specialty Company 134
Holophane Co 124, 125
Hope & Sons, Henry 86

Illinois Engineering Company 171
Improved Office Partition Company. 42
Indiana Limestone Quarrymen's Association 21
International Casement Co 87

Jenkins Bros 159
Johns-Manville, Inc 145
Johnson Service Company 147

Kaestner & Hecht Co 38
Kawneer Co., The 90
Kelsey Heating Company, The 141
Kelvinator Corporation 118
Kensington Mfg. Company 45
Kent-Costikyan Trading Company ... 46
Kerner Incinerator Co., The 117
Kewanee Boiler Company 4
Kewanee Private Utilities Co 156
Kewaunee Mfg. Co 132
Keystone Roofing Manufacturing Company 75
Knapp Brothers 86
Kny-Scheerer Corporation of America 138
Kohler Company 163

Lloyd Co., W. H. S 50
Long-Bell Lumber Co 80
Louisville Cement Co 25
Ludowici-Celadon Company, The ... 72

Macoustic Engineering Company ... 6
Maddock's Sons Company, Thomas .. 162
Mahogany Association, Inc 52
Martin Varnish Co 56
Massillon Steel Joist Company .. 4th Cover
Master Builders Company, The 68
Matthews Bros. Mfg. Co 53
Milwaukee Corrugating Co 156
Mississippi Wire Glass Co 94
Mount & Robinson, Inc 30
Muller & Co., Franklyn R 66
Murphy Door Bed Co., The 51

Nash Engineering Co 37
National Building Granite Quarries Association 22
National Fire Proofing Company 1
National Lead Company 62
National Metal Molding Co 130
National Mortar & Supply Co..128, 129
National Steel Fabric Co 135
National Terra Cotta Society 13
National Tube Co 153
Nelson Corp., The H. W 137
New Jersey Wire Cloth Company ... 82
New Jersey Zinc Company 77
Northwestern Terra Cotta Co., The .. 14
North Western Expanded Metal Co. 5

O'Brien Varnish Company 60
Otis Elevator Company 120

Pacific Lumber Co., The 76
Peelle Company, The 85
Pfaudler Co., The 60
Pittsburgh Plate Glass Co 93
Plate Glass Mfrs. Ass'n 94
Portland Cement Association 24
Pratt & Lambert, Inc 61

Ramp Buildings Corporation 11
Raymond Concrete Pile Company .. 3
Reading Iron Company 152
Richards Wilcox Mfg. Co .....2nd Cover
Richardson Roofing Company, The .. 73
Roddis Lumber & Veneer Company. 81
Ruberoid Co., The 69
R. U. V. Co., Inc., The 2
Ruud Mfg. Co 143

Samson Cordage Works 142
Sandusky Cement Company, The .... 3rd Cover
Sargent & Company 27
Schumacher & Co., F 49
Simplex Wire and Cable Co 116
Smith & Egge Mfg. Co., The 86
Smyser-Royer Co 122
Sonneborn Sons, Inc., L 169
Speakman Company 158
Spencer Turbine Company, The 148
Standard Gas Equipment Corp'n ... 121
Stewart Iron Works, The 140
Straus & Co., S. W 96
Sturtevant Co., B. F 140

Thatcher Furnace Company 148
Todhunter, Arthur 50
Trenton Potteries Co 157

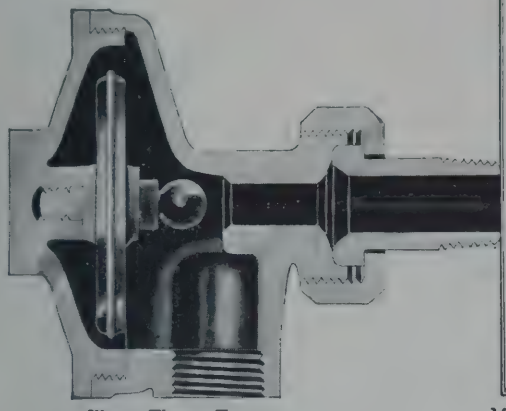
United Alloy Steel Corporation 142
United States Gypsum Company ... 107
United States Mineral Wool Co 136
United States Radiator Corporation 149

Van Range Co., John, The 95
Van Zile Ventilating Co 144
Vonnegut Hardware Co 29

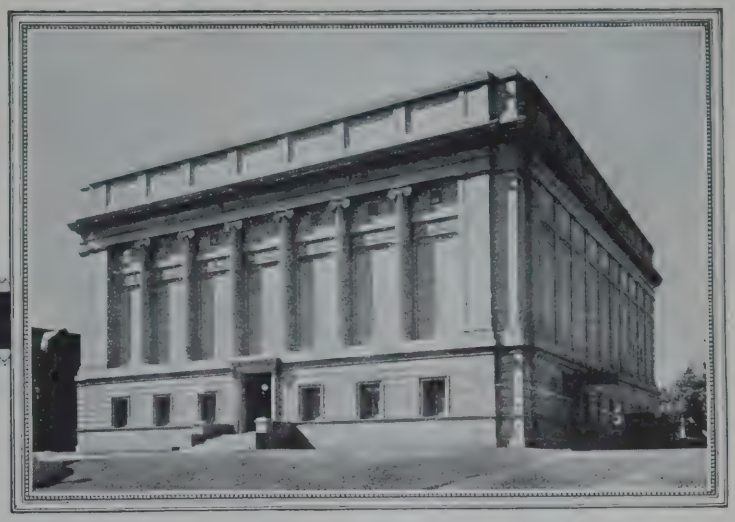
Wallace & Tiernan Co 136
Wallpaper Mnfrs. Assn 55
Weatherbest Stained Shingle Company 76
Western Brick Company 12
Western Electric Company 126
Wilson Corpn., The J. G 94

Young Pump Co., The 144

Zouri Drawn Metals Co 64



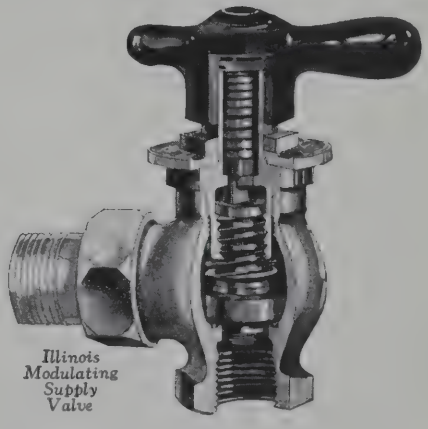
Illinois Thermo Trap



Masonic Temple, Paterson, N.J. F.W. Wentworth, Architect. G.S. O'Neil, Heating Contractor

Nearly a Quarter-century of Technical Leadership Has Demonstrated the Value of Illinois Heating Systems in Control and Economy of Operation

Illinois heating devices of 1900 are still doing their work satisfactorily—without cleaning or renewal costs. This long record of achievement is a familiar one to engineers and architects. The element of chance is eliminated. Illinois Products during this span of years have paralleled the progress of advanced engineering science, so that the heating field has bestowed on them the distinction of leadership. Illinois Products are guaranteed to give perfect operative results. They are distinguished by long life, ease of control and economy of operation.



Illinois Modulating Supply Valve

ILLINOIS
HEATING SYSTEMS

Our Engineering Department cooperates efficiently with engineers and architects in developing details of design, installation and efficiency. *Write for Bulletin No. 25.*

ILLINOIS ENGINEERING COMPANY

INCORPORATED 1900

ROBERT L. GIFFORD, *President*

General Offices and Factory: CHICAGO, ILLINOIS

Branches and Sales Offices

ATLANTA	CHATTANOOGA	ERIE	MEMPHIS	PEORIA	ROCHESTER
BALTIMORE	CLEVELAND	HARRISBURG	MILWAUKEE	PHILADELPHIA	ST. LOUIS
BIRMINGHAM	COLUMBUS	HOUSTON	MINNEAPOLIS	PITTSBURGH	SAN FRANCISCO
BOSTON	DALLAS	INDIANAPOLIS	NASHVILLE	PORTLAND	SEATTLE
BUFFALO	DENVER	KANSAS CITY	NEW YORK CITY	PROVIDENCE	SPOKANE
CEDAR RAPIDS	DETROIT	LOS ANGELES	OMAHA	RICHMOND	TOLEDO

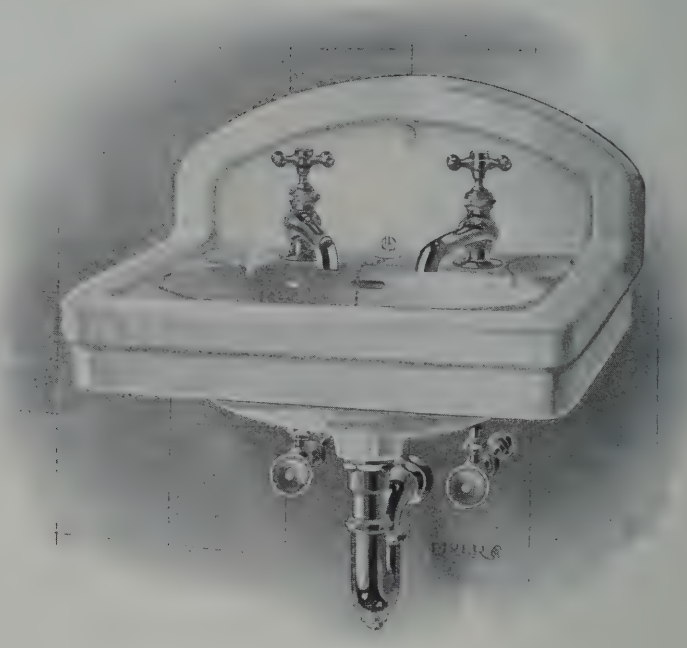
Consult Local Telephone Directory

Why pay a high price

?

Two-fired
real vitreous china.

There is no better quality.



15 X 18—LYNDON NO. 252
LARGE BOWL 10″ X 15″

The Lyndon gives every utility value of the 20-inch size lavatory.

And at a 35% saving in cost.

It is a space saver.

The Lyndon is a two-fired real vitreous china lavatory, made of the same material in the same way as the largest and most expensive lavatories.

ELJER CO. FORD CITY, PA.

CONTRAST—white against black, grays and variegated greens—that is the beauty of snow.

So, the clean-cut, pleasing beauty of the home whose walls are made of Medusa White Portland Cement Stucco is sharpened through contrast with *its* surroundings.

And stucco is just one of the many uses for Medusa White Portland Cement. Medusa Books, and our Catalogs in "Sweet's," pages 102-103 and 349-351, discuss the uses of this exceptional material and give exact specifications. We shall be pleased to send you the books on request.

Leading Applications for Medusa White Cement:—

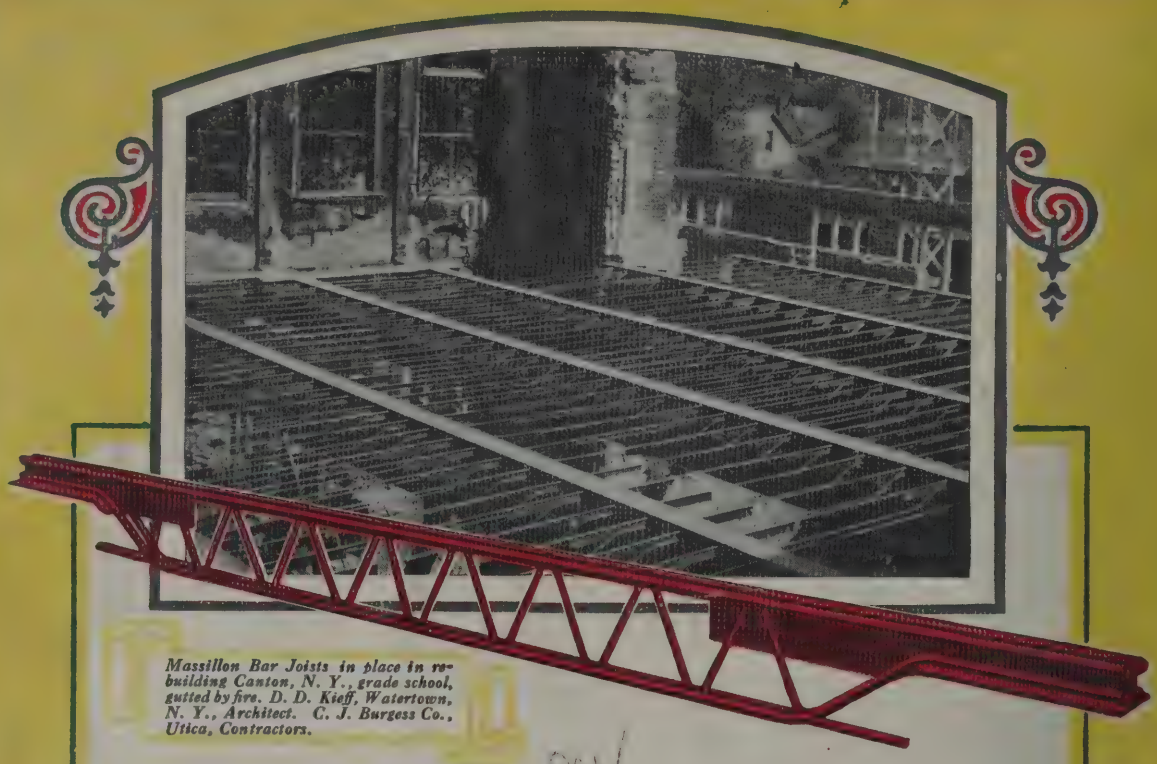
Artificial Stone
Cement Plaster
Cast Stone
Concrete Block Facing
Cement Brick
Cement Mantels
Floor Tile
Lawn Furniture
Mortar
Ornamental Cement Work
Lamp Standards
Stucco
Swimming Pools
Shower Baths
Traffic Markers
Terrazzo Tile
Table Tops and Counters

—and many more

THE SANDUSKY CEMENT CO., Dept. F, Cleveland
New York: 350 Madison Ave. **Dixon, Ill.: 34 Dixon National Bank Bldg.**

Manufacturers of Medusa Non-Staining White Cement (Plain and Waterproofed); Medusa Waterproofing (Powder and Paste); and Medusa Gray Cement (Plain and Waterproofed).

MEDUSA
WHITE CEMENT



Massillon Bar Joists in place in rebuilding Canton, N. Y., grade school, gutted by fire. D. D. Kieff, Watertown, N. Y., Architect. C. J. Burgess Co., Utica, Contractors.

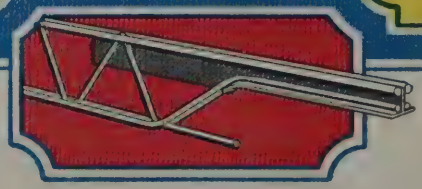
Build Fire Out *Now!*

Last July the Canton Grade School at Canton, N. Y., was gutted by fire. The brick walls alone remained standing. The school board adopted a "never again" policy and rebuilt with Massillon Bar Joist firesafe floors, using the old walls for support. A new addition also embodies the same type of floors. Don't wait for flames to drive you to Massillon Bar Joist firesafe floors. *Build fire out now.* Massillon Bar Joists are made in 22 standard sizes, meeting every span and load requirement. Piping and conduits can be installed in any direction without raising floor level or suspending ceilings. The joists are quickly installed and need never be cut except where they extend into outside walls far enough to interfere with face brick. Write us for complete information and safe loading tables.

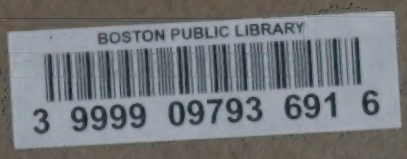
The Massillon Steel Joist Company, Massillon, Ohio

MASSILLON BAR JOISTS

PATENTS PENDING



PRINTED IN U. S. A.

CHARLES FRANCIS PRESS, NEW YORK

NOV 4 1925